

PULP & PAPER

FEBRUARY 1959

Paper Week "Preview"

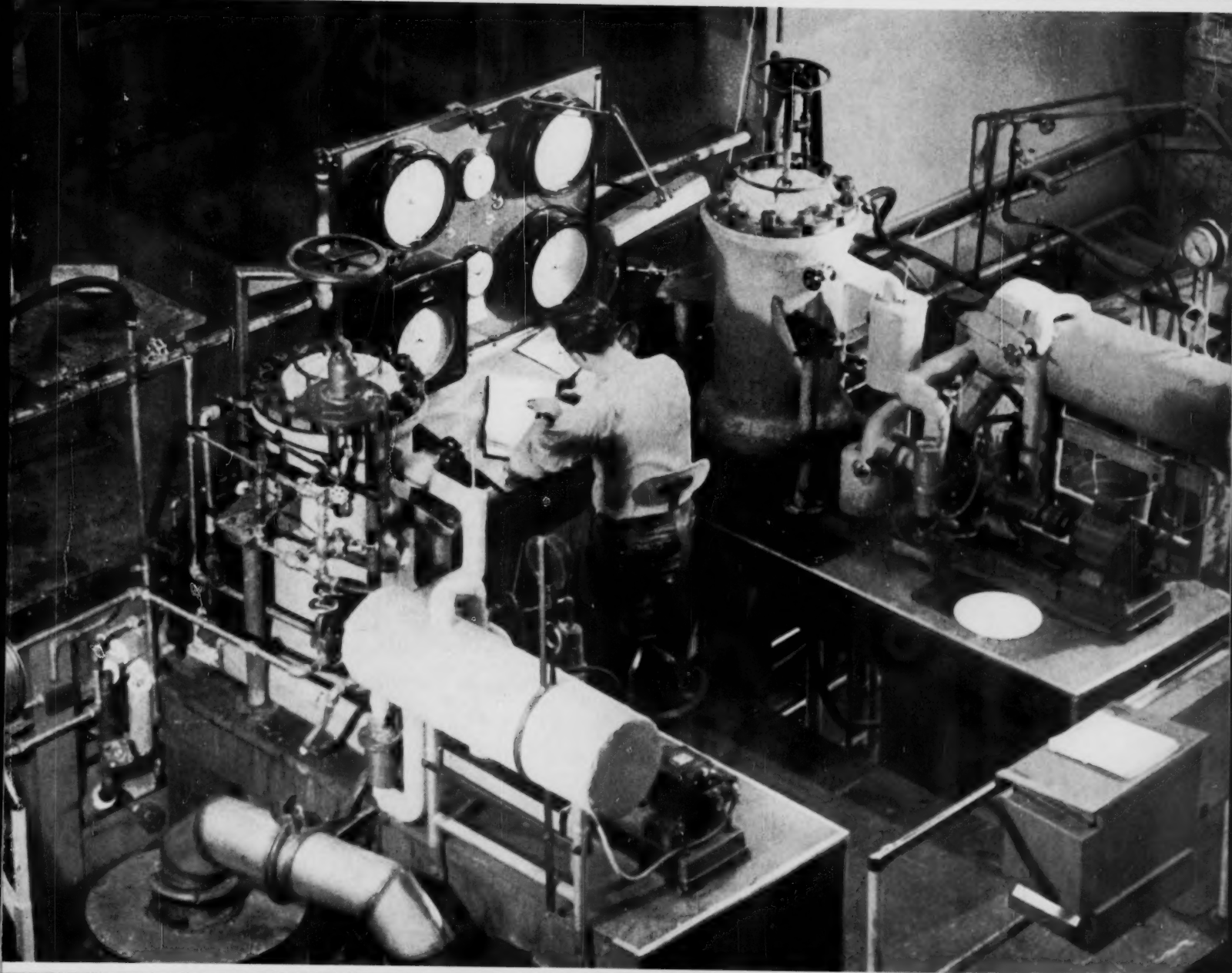
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Report from Cuba on Bagasse

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Fee for Forestry Aid?

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BIRTHPLACE OF A NEW PULP

... cooking platform in Abitibi's Central Pulp & Development Div. Sault Ste. Marie, Ont., Canada, where new process for ...



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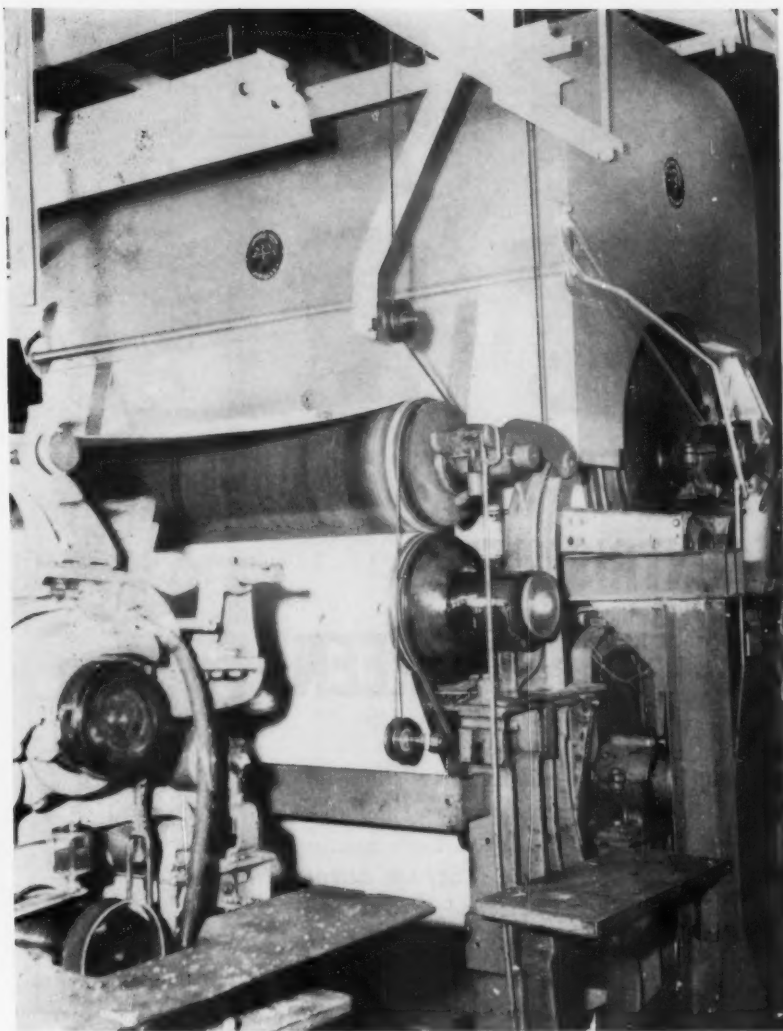
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- ★ Container Corporation of America
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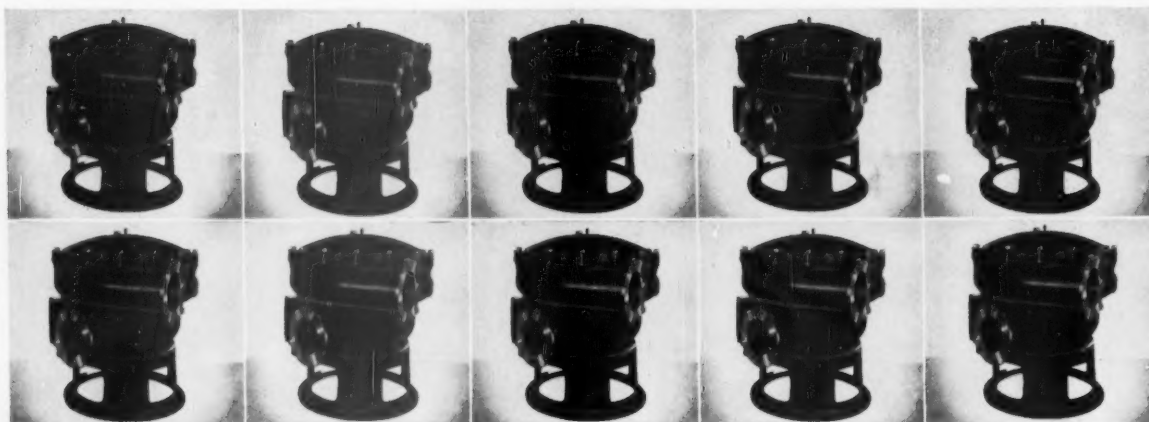
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The Bookworm's Lament; Woodpulp By-Products May Help That Ulcer; Weyerhaeuser Increases the Fish Population; American Chemical Society Needs Funds.

Paper Week Previews—Optimistic 55

Morris Dobrow, veteran prognosticator, warns of inflation, but predicts new records in 1959. James R. Lientz to be new TAPPI president; K. O. Elderkin is Gold medalist.

Exclusive—Cuba's Success with Bagasse 60

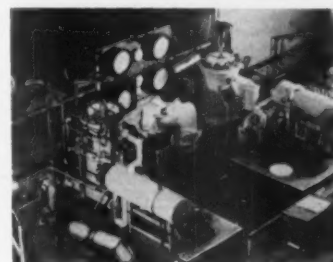
Direct from Havana, as nation's new hero, Castro, finally ousts Dictator Batista, comes this timely report showing remarkable advances made in use of bagasse. Cuba may even export bagasse newsprint.

Starch and Clay System at Wisconsin Mill 64

Big savings in manpower and in raw material purchases have been effected by Consolidated Water Power & Paper Co.'s Biron mill in bulk materials handling systems.

COVER PICTURE

The two digesters in this Abitibi laboratory (2 cu. ft. each) are on each side of instruments. Also shown—two heat exchangers and top of one blow tank at lower left. Here, Abitibi scientists made one of significant pulping discoveries of recent years.



An Improved Pulp with Many Uses 66

This is the first published report in the United States fully explaining the sensational Arbiso process. An article specially written for PULP & PAPER rounds up all developments—proven qualities, characteristics, varied uses for different paper grades.

Should Industry Charge for Forest Aid? 105

Wisconsin industry organization finds that it pays to charge small fee to landowners who are given assistance.

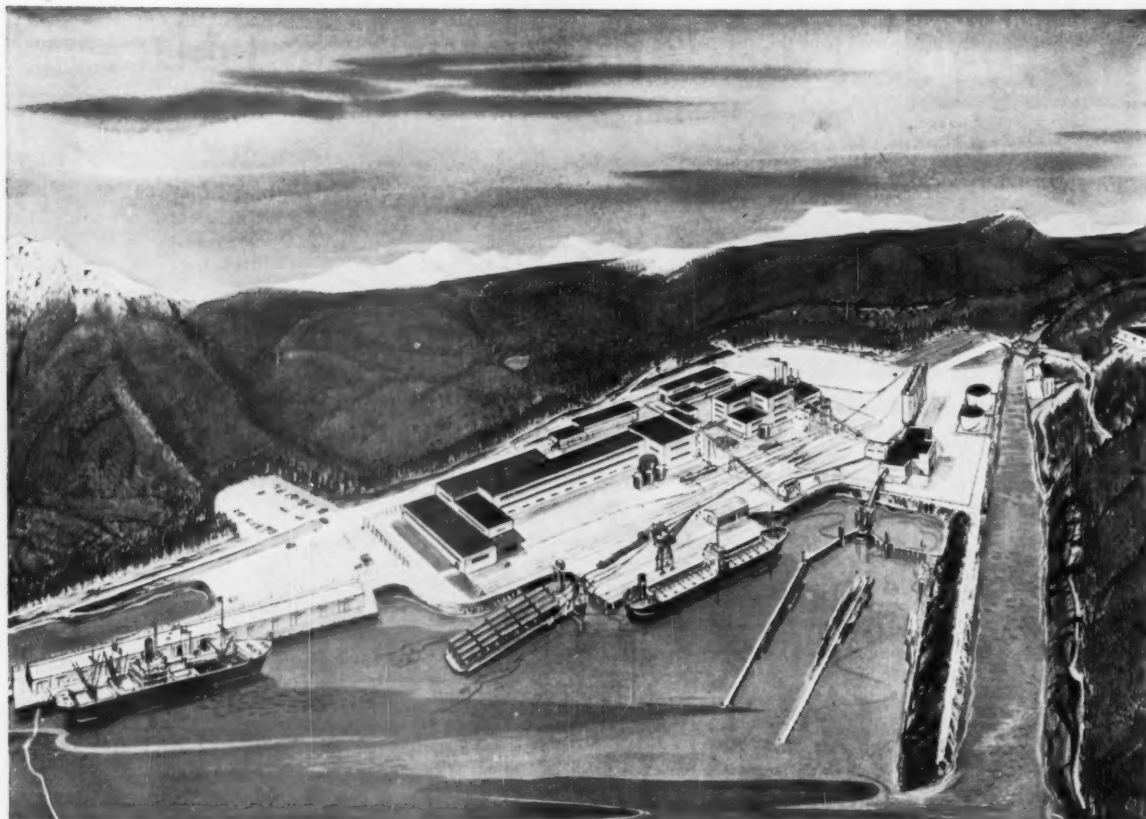
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Architect's drawing of the huge \$55 million pulp mill now under construction at Sitka, Alaska by the Alaska Lumber & Pulp Company, Inc.

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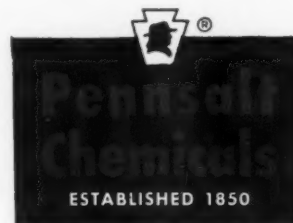
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PULP & PAPER

The Editor Reads His Mail



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geno, Kantstrasse 22



MILLER FREEMAN PUBLICATIONS

Two Opposing Viewpoints On Timber Appraisal Methods

Mr. Eli Ferguson, Second Vice
President,
Equitable Life Assurance Society of
the U. S.
New York.

Dear Mr. Ferguson: Your paper presented at the Annual Meeting of the American Pulpwood Association last year (published in July issue of PULP & PAPER), together with those of Dr. Worrell, and Messrs. Meagher and Bryson, is of considerable interest to me. In particular, I note your comments with regard to the appraisal of land and timber values.

The arguments that you make for market value and against both cost and expectation values are well taken. However, it seems to me, you completely disregard the necessity of substituting cost or expectation values for the market value of forest properties in many instances.

What does one do if no "market" exists in the economic sense? A market price can only become apparent as the result of a large number of transactions of a relatively homogeneous product between buyers and sellers both with reasonably full knowledge of the value of the commodity and not under excessive pressure to buy or sell. How many of these conditions are likely to be met in an average sale of a tract of forest land? How many times do both buyers and sellers truly realize the present worth of the commodity they are dealing in? Is any one tract of land and the timber upon it ever quite the same as the next? Are the two parties to the transaction ever really free agents with complete knowledge of the values involved? Is not some part of the value attributed to a forest property by a buyer or seller often dependent upon non-forest values? Does not apparent over-abundance or, on the other hand, scarcity of forest land and timber have a large bearing on so-called market prices?

As a direct result of the above and many other complexities, forest economists have sought alternate methods of placing a value on forest land and the timber growing upon it. The valuation of very young stands with no

presently saleable products poses a special problem. Even the valuation of stumpage, the value of standing timber, poses a problem. In this connection I believe you will be interested in a recent article by Dr. John A. Zivnuska and Ann Shideler "Is Price Reporting for Standing Timber Feasible?" in the June issue of the *Journal of Forestry*.

In conclusion, may I say that it is a stimulating experience to find an accountant, a tax expert, and an investor discussing forest values side-by-side with a forest economist. Such discussions may well lead to earlier solutions of problems in this and other fields of forestry endeavour.

J. W. KER
Associate Professor, School of
Forestry
University of British Columbia,
Vancouver, B.C.

Mr. Ferguson's Reply

Dear Professor Ker: The thinking on this subject seems to differ depending upon the area which one is considering. Where markets for timber are well established and there is no great surplus of old growth hanging over the market, the method of appraisal which I briefly described in my talk is well accepted. We think it is also applicable to areas such as yours.

Of course, the job of appraising is more difficult there, but we think the market approach is less subject to serious errors than is the one method which we have seen. This method involved accumulation of growth based on yield tables for 100 years or so and then discounting the resulting values back to the present.

We would much prefer to determine what the property could be sold for, now and discount that value for the time it would take to accomplish the liquidation. However, I don't think any thorough appraiser should refuse to consider any approach to the valuation of a property. Instead, he should test the problem by all applicable approaches and, on the basis of the information developed, settle on a value which, in his judgment, is realistic.

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MONTHLY REPORT — WORLD NEWS

CONTINUED GROWTH IN DEMAND AND CONSUMPTION

of various grades of paper and board during 1959 is forecast by the U.S. Department of Commerce. This favorable outlook, based on an over-all upturn in U.S. economy, foresees a 1959 total production of about 32,000,000 tons, some 4% higher than in 1958 and 1957 and a 2% increase over 1956's all-time high.

EUROPEAN OUTLOOK IS BRIGHT . . . Woodpulp requirements by 1965 should be at the very least some 4,000,000 tons higher, and a guaranteed fiber supply will be a paper producer's most valuable asset. This was the view expressed recently by James L. Ritchie, director of U.S. Pulp Producers Assn., at a meeting of the British Wood Pulp Assn. James F. R. Moddrell, president of the British group, said "long-term prospects are impressive."

WORLD NEWSPRINT DEMAND IN 1959 WILL BE ALL-TIME HIGH, according to the Newsprint Assn. of Canada. Demand will exceed 14,-200,000 tons, based on an expectation that North America alone will consume 7,300,000 tons—equal to the all-time high set in 1956. Canadian 1959 shipments have been estimated at 6,140,000 tons (see article in this issue).

60,000 OWNERS OF NEW SWEDISH MILL . . .

Skogsagarnas Cellulosa is located in southern Sweden, on an ice-free harbor, in an area that enjoys mild winters. Some 60,000 private forest owners and their associations own the mill and at their command are some 15 million acres of good forest lands. About 80% of the wood will be trucked to the mill on a continuous year round basis. Two Kamyr continuous digesters will produce two types of pulp.

BAGASSE PAPER AND BOARD DEVELOPMENT is successful in Cuba, despite recent disruptions during the revolution. Success seems assured for bagasse newsprint, and Cuba reaches out for other markets (story in this issue).

HIGHER OUTPUT LEVELS ARE FORECAST for pulp and paper machinery builders during the second half of 1959 by the U.S. Department of Commerce, with the comment: "If our economic recovery becomes fully sta-

bilized, contemplated plant expansions of paper producers may be formalized and substantial new equipment orders placed during 1959."

WORLD WOOD HARVEST IN 1957 WAS SLIGHTLY LOWER THAN IN 1956.

Nevertheless, new records were set in production of chemical woodpulp, newsprint and other grades of paper, board and fiberboard. The volume of forest products exports increased by almost 4% from the previous year, while the value of exports was up about 3%. Statistics released by the Food & Agriculture Organization of the United Nations show world output rose to 50,100,000 tons; newsprint to 12,350,-000; paper other than newsprint to 28,-500,000; paperboard to 20,400,000, and fiberboard to 3,400,000 tons.

THE LONG-PREDICTED BLEACH SULFATE PAPER AND PAPERBOARD

mill of Continental Can Co. will be constructed on the Savannah river near Augusta, Georgia, U.S.A. Construction of the 350-ton plant was to get underway early this year, with production set for early 1961. Continental will consume the bulk of the output and will offer the remainder for outside sale. Initial capacity will be provided by a 216-in. trim Fourdrinier machine by Beloit Iron Works.

SURPRISING TRENDS IN WORLD NEWSPRINT . . .

Japan has become self-sufficient. Many other nations are becoming independent of outside sources. Continental Europe produces 60% of its requirements (article in this issue).

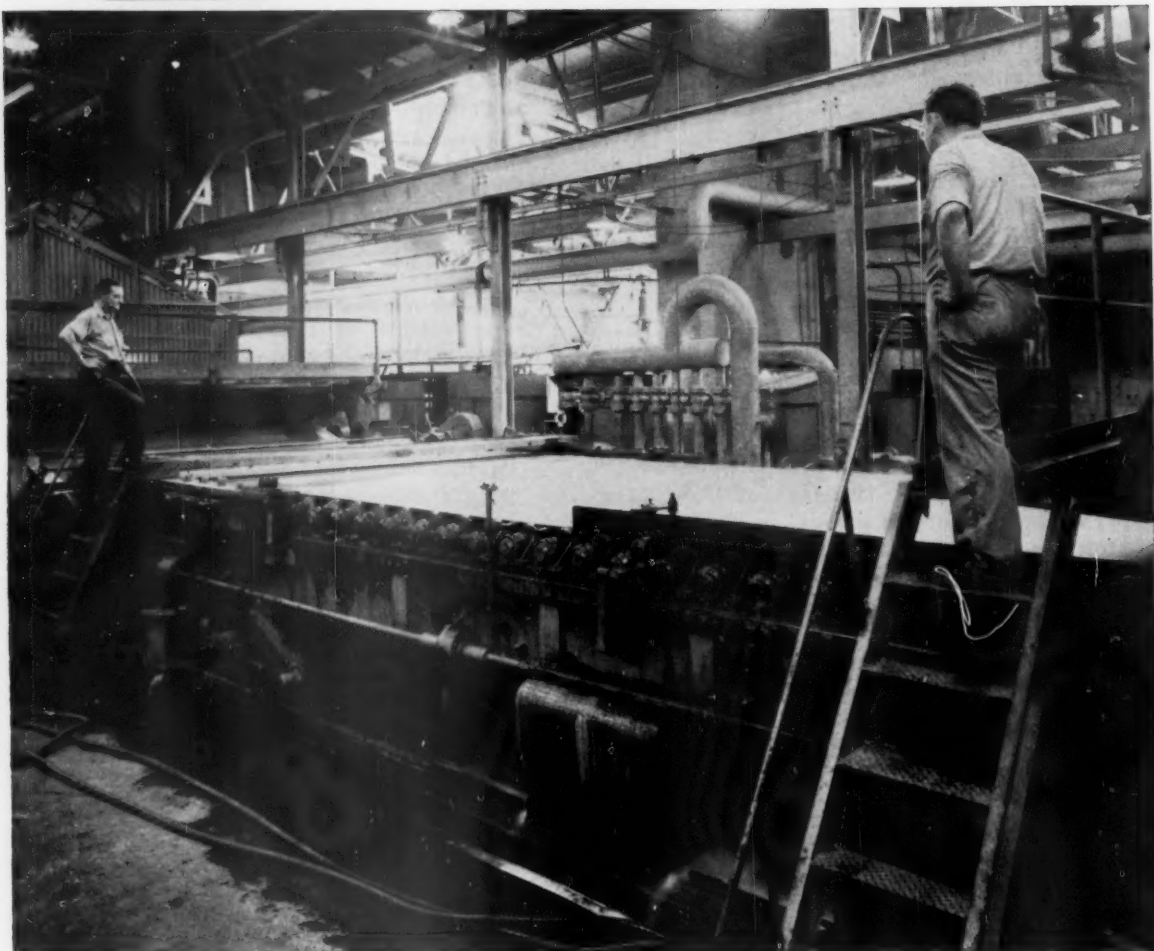
POPULATION GROWTH INCREASING PAPER DEMAND . . .

In the United States the population recently passed the 175,000,000 mark (according to a U.S. Dept. of Commerce estimate) and will climb to 200,-000,000 by 1967. An American paper consumer is born every 7 1/2 seconds, one dies every 21 seconds, one enters the country every 1 1/2 minutes, and one leaves every 20 minutes.

ST. REGIS PAPER CO. (U.S.A.) IS PARTNER IN SOUTH AFRICA . . .

Reports from Johannesburg welcomed St. Regis' investment in its expanding economy by acquisition of a

B.F. Goodrich



No water spray, no paper spots with B.F. Goodrich table rolls

WITH B.F. Goodrich Dukbak table rolls on your Fourdrinier, there's no danger of water spray returning to the wire and spotting the sheet. That's because Dukbak rolls shed water fast, throw it down and away, not up against the wire. The result is more uniform water removal, and better paper formation. B.F. Goodrich table rolls can run at speeds up to 1000 feet per minute without deflectors.

Because these B.F. Goodrich table rolls are ground straight and true, they

move evenly with the wire without developing high or low spots. The rolls are dynamically balanced to prevent whipping even at high speeds. The sheet that's produced is smooth and uniform.

In addition to better performance, B.F. Goodrich Dukbak table rolls have many other cost-saving advantages. Cover separation is impossible because the rubber is locked to steel by the patented Vulcalock process, the strongest rubber-to-steel adhesion known

today. Corrosion is impossible because the ends are sealed against moisture. And, after years of hard service, Dukbak rolls can be reground as good as new.

Let a B.F. Goodrich man show you how these longer-lasting rolls can improve the quality of your paper. And if you are buying a new Fourdrinier, be sure to specify B.F. Goodrich Dukbak to your machine builder. *B.F. Goodrich Industrial Products Co., Dept. M-512, Akron 18, Ohio.*

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MONTHLY REPORT — WORLD NEWS

50% interest in a group of container manufacturers and predicted it may lead to expansion throughout Africa. The companies are Transvaal Box Mfg. (Pty.) Ltd., National Containers (Pty.) Ltd. and Atlas Box Co. (Pty.) Ltd. Total annual sales volume is about \$5,000,000. Board will come from the new St. Regis mill at Jacksonville, Fla., U.S.A.

A HAPPY 1959 FOR PULP AND PAPER is foreseen by Thomas B. McCabe, president of Scott Paper Co. "Mr. and Mrs. Consumer," he reports, "have clearly expressed their confidence in the future. It appears that for 1958 total U.S.A. paper and paperboard production will about equal 1957 levels. In 1959 total production will undoubtedly rise with improvement in the general economy. . . . The future holds great promise."

SELF-SERVICE STORES BOOST PAPER CONSUMPTION IN EUROPE . . . In several countries super markets (self-service stores requiring paper packaging to a greater extent than other stores) are being opened. In the London area there are about 180 such stores. A year ago there were about 80, and in 1955 they were very rare. . . . A few super markets have opened in Rome, according to Dr. Pietro Ghisoni, technical director for Vita Mayer & Co. A complete and fully stocked super market will feature the United States exhibit at the International Trade Fair in Barcelona, Spain, in June, boasting a stock of 4,000 items.

JAPAN WILL INCREASE PRODUCTION . . . Paper output will increase 9% and pulp production 17%, according to reports from PULP & PAPER INTERNATIONAL'S Tokyo editorial representative.

NEW SWEDISH PLANT MAKES 50,000 BAGS PER SHIFT . . . Uddeholm, central Sweden's large mining, steel and forest products firm, has opened a paper bag plant at Skoghall on Lake Vanern. The highly automated plant produces bags for cement, fertilizers, sugar, salt, flour and fodder mill products, chemicals, etc. Five tons of sealing tape and gummed paper are also produced per shift. Skoghall's an-

nual output includes 150,000 tons of pulp and 50,000 tons of paper products.

BOOM IN COATING IN SOUTHERN U.S.A. . . . Without much fanfare, several mills in the Southern states have begun production of coated kraft paperboard. By latest count, eight mills in this region are reportedly coating. In some cases it is still not announced. At least two others will join the parade before long.

OVER 85 BILLION PAPER TOWELS will be consumed in the United States this year—500 paper towels for every man, woman and child in the country, according to the Tissue Assn. Inc.

LONG-TERM LEASING OF PRODUCTION EQUIPMENT by U.S. pulp, paper and allied products industries spurted to an all-time high in 1958 despite the recession. According to Nationwide Leasing Co., Chicago, volume of equipment in America on lease reached \$8,300,000 in December, a 33% gain over a year ago. Pulp and paper and allied industries ranked among the first 10 users of leased equipment.

WORLD HEADLINES . . . Venepal (C. A. Venezolana de Pulpa y Papel) at Boca del Yacuy, Venezuela, is producing kraft paper following a damaging fire last fall. Still in the planning stage is the firm's proposed pulp mill. . . . In New Zealand, according to the Director of Forestry, it is planned to boost newsprint output to 90,000 long tons annually, then to double that figure by the early installation of a second machine. . . . Mexico reports plans for two new newsprint mills with a combined capacity of 70,000 metric tons. . . . The Dominican Republic's first mill will produce kraft paper and board and will utilize wastepaper and imported pulp. Its market will be strictly local. Four box and bag factories are already in production. . . . In Brazil a new mill is nearing completion at Parintina. . . . Another is planned at Belem, Peru. . . . A high postwar birthrate in France means more demand for paper. By 1975 in continental France alone the population is expected to increase 3,649,000 to a total of 47,938,000.

Adequate lubrication, vital to life of Calender Stack, supplied by Farval

FARVAL—
Studies in
Centralized
Lubrication
No. 191



● In producing 700 feet per minute of fine paper smoothly and continuously, this Calender Stack must have adequate lubrication of all bearings. Adequate means not only *sufficient* lubricant to keep bearings running cool and without drag, but also *just enough* lubricant to prevent dripping and spoilage of paper.

This particular Calender Stack at Hammermill Paper, Erie, Pa., is satisfactorily lubricated by a Farval Automatic System. Installed in 1947, there has not been a shutdown or delay due to faulty lubrication in 9 years.

Farval, the pioneer system of centralized lubrication since 1926, employs the famous Dualine principle. It insures correct delivery of oil or grease at all times to any number of bearings. For complete information, write for Bulletin 26-R.

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KEYS TO ADEQUATE LUBRICATION—

Wherever you see the sign of Farval—the familiar central pumping station, dual lubricant lines and valve manifolds—you know a machine is being properly lubricated.

18 bearings on this Calender Stack are lubricated by Farval. Immediately in the foreground is the automatic central pumping station.



MONTHLY REPORT — WORLD NEWS

TO BUILD OXFORD PULP MILL . . . Rust Engineering Co. and subsidiaries enter this year with a contract carryover of nearly \$100,000,000 in new plant spending, about half still to be performed. A pronounced increase in major bookings occurred during the last quarter of 1958, says Rust. These include engineering and construction of a \$15,000,000 pulp mill and auxiliaries for Oxford Paper Co., Rumford, Me. Largest Rust project underway is a multimillion-dollar expansion for Hammermill Paper Co., Erie, Pa., to be completed in 1959. Also: a new paper machine at Halifax Paper Co. Inc., Roanoke Rapids, N.C., and paper machine modernization at New York & Pennsylvania Co.'s mill in Johnsonburg, Pa.

IN THE PACKAGING FIELD, A THREE-WAY MERGER

. . . Three major United States producers of packaging products have announced merger plans: American Box Board Co., Grand Rapids, Mich.; Central Fibre Products Co., Quincy, Ill., and Ohio Boxboard Co., Rittman, Ohio. If approved, the consolidation will bring together facilities producing jute and kraft linerboard, boxboard, bleached kraft, corrugating medium, molded pulp products, egg packaging products, shipping containers and folding cartons.

WELL LUBRICATED . . . A recent survey shows that in 1956 the pulp and paper industry consumed 4,247,000 gal. of lubricating oil, giving it a No. 9 ranking among standard industrial classifications. Its consumption of grease, however, placed it sixth on the list. The survey also pointed out that pulp and paper employs 77 members of the American Society of Lubricating Engineers.

STEAM AND ELECTRIC GENERATING CAPACITY IMPROVED

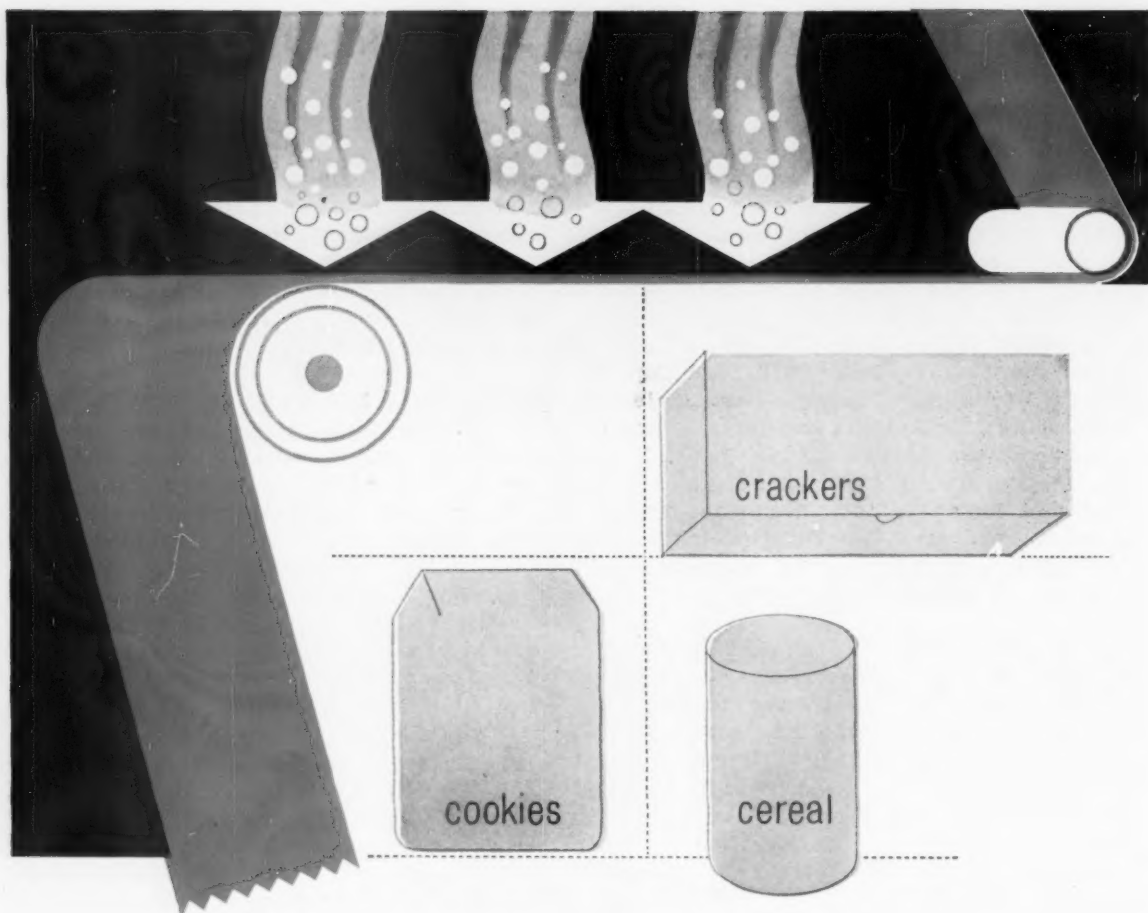
. . . At Rhinelander Paper Co., Rhinelander, Wis., the \$4,500,000 modernization project includes the construction of a building to house a new boiler; a water treatment plant, and a turbine generator of the extraction back-pressure type.

FIFTH BLEACH STAGE ANNOUNCED . . . An \$800,000 chlorine dioxide unit is being added to the kraft bleach plant of Crown Zel-

lerbach Corp.'s Camas, Wash. mill. Production is set for late summer. The project adds a fifth stage to the \$2,700,000 kraft bleach plant that went into operation in mid-1957. Res. Mgr. F. O. Boylon termed the construction "part of the continuing business of keeping Crown products fully competitive in an ever-changing paper industry."

HOPSCOTCHING THE NORTH AMERICAN INDUSTRY

. . . Provincial Paper Ltd. has embarked on a general expansion to provide increased production of the fine paper grades. Coincidental with this expansion is installation of a trailing blade boater. The new process will supplement conventional roll-coating. . . . **Standard Packaging Corp.**, with headquarters in New York, N. Y., has acquired **Chemical Paper Mfg. Corp.**, Holyoke, Mass. The assets of Chemical Paper, long a producer of rag and sulfite writing paper, paper products and box board, were bought for \$2,600,000 cash. . . . The packaging div. of **Olin Mathieson Chemical Corp.** has opened a forest products research center at W. Monroe, La., for more intensive research in utilization of local hardwoods as a raw material. Included are an experimental paper machine, pulping and bleaching equipment and experimental coater. . . . **Thilmany Pulp & Paper Co.**, Kaukauna, Wis., will build an addition to its main office at a cost of \$100,000. . . . Stockholders of **Flintkote Co.** have approved merger of **Hankins Container Co.** and the purchase of all assets and business of **Orangeburg Mfg. Co. Inc.** . . . A contract to design, engineer, manufacture and install a completely electronic-pneumatic instrumentation system at **St. Francisville Paper Co.** has been awarded to Panellit Inc. St. Francisville is a joint project of Crown Zellerbach Corp. and Time Inc. More than \$500,000 will be invested. . . . **Crown Zellerbach Canada Ltd.** has acquired **Clark Papers Ltd.**, one of western Canada's pioneer distributors of fine and coarse paper products. . . . **Riegel Paper Corp.** has purchased Quality Lithographing Co., Atlanta, Ga. . . . **Cascade Lumber Co.**, Yakima, Wash. subsidiary of **Boise Cascade Corp.**, merged with the parent firm Jan. 1 and now operates as a division.



New way to protect flavor and aroma

IONOL[®] CP antioxidant guards against rancidity

Now you can offer your customers in the food industry packaging materials that will increase their products' shelf life, effectively and economically. When used to impregnate food packaging materials, Ionol CP antioxidant guards against rancidity by retarding the attack of oxygen on fats at the surface of cartons and wrappers.

Ionol CP is a non-toxic, economical material which is readily applied to paper products. By test, baked goods stored at 85°F. in box-

board cartons impregnated with Ionol CP were free of rancidity at the end of 90 days. Without Ionol CP protection, packaged baked goods stored under similar conditions can rancidify within a week.

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IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver



Synthetic Fiber Papers—Japan

MITA, MASASHI, and SAEKI, TADAO I. The manufacture of polyvinyl alcohol papers. J. Japan. Tech. Assoc. Pulp Paper Ind. 12, no. 1: 41-3 (Jan. 1958). [In Japanese; English summary] Abstr. Bull. Inst. Paper Chem. 29: 389.

Vinyon (polyvinyl alcohol) fibers bonded with similar (but more water-soluble) fibers were made into 100% polyvinyl alcohol paper sheets on a regular paper machine. Although tensile and burst strengths increased with increasing binder content up to 30%, folding strength reached a maximum at 8% binder content. As a compromise, about 20% or lower binder contents seem indicated. C.L.B.

MITA MASASHI, and SAEKI, TADAO. II. The manufacture of 100% nylon paper. J. Japan. Tech. Assoc. Pulp Paper Ind. 12, no. 1: 44-6 (Jan., 1958). [In Japanese; English summary] Abstr. Bull. Inst. Paper Chem. 29: 389.

Nylon-fiber paper high in chemical resistance, porosity, and mechanical strength properties (tensile, fold, tear, and flexure) was produced on a cylinder machine, using polyvinyl alcohol fibers (dissolving in water at 65-75° C.) as the binder and carboxymethyl-cellulose or a vegetable gum (mucilage obtained from the root of tororoai) as dispersing agent. C.L.B.

Chestnut Pulp in Italy, France

BENSI, GIANFRANCO. Cellulosa e carta (Rome) 9, no. 6: 3-19; no. 7: 9-25 (June, July, 1958). [In Italian; French, English, and German summaries] Abstr. Bull. Inst. Paper Chem. 29: 421-2.

A review covering the morphological and physiological characteristics of chestnut, its geographical distribution, its cultivation, and statistical data concerning production and industrial utilization in Italy during the last two decades. Because of the spread of chestnut diseases (bark cancer and "ink disease"), its cultivation as a fruit tree is being gradually abandoned, and utilization of younger trees (5-40 years old) for timber and tannin production is increasing. Chestnutwood contains 27-30% cellulose, 15-19% pentosans, 6.6-10.8% lignin, and about 13% tannin. Tannins are extracted from chips with water, and the purified and evaporated commercial tannin

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preparations, utilized by the leather industry, contain 90-95% of the chestnutwood tannin. In Italy, an average of 273,800 cu. m. chestnutwood is consumed annually for the production of tannin. The tannin-free chips are utilized as fuel for the production of steam needed in the manufacture of tannin extracts; recently, the production of furfural from this material has started. The suitability of the extracted chips for pulping is being investigated. In France, bleached chestnutwood soda pulp, manufactured by two companies, is used as a paper-making material in 3:1 mixtures with long-fibered pulps. In Italy, hardboard (by the Masonite process) and semi-chemical pulp were manufactured from chestnutwood chips for several years by one company, until the mill was closed in 1954. This limited industrial experience, as well as laboratory data available, demonstrate, however, that extracted chestnutwood chips can and should be used, particularly in view of the growing shortage of papermaking raw materials and the shrinking markets for tannins. J.S.

Determining Pulp Whiteness—Germany

TRÖGER, HORST, and LUTZ, GERDA. Determination of the degree of whiteness of moist chemical and mechanical pulp sheets. Zellstoff u. Papier 7, no. 7: 206-7 (July, 1958). [In German] Abstr. Bull. Inst. Paper Chem. 29: 401-2.

A rapid method for determining the final degree of whiteness of chemical and mechanical pulps by measuring the whiteness of sheets of any moisture content coming off the pulp-drying machine is described. Samples weighing 8.0 ± 0.5 g. (ovendry) are dispersed in distilled water and made into hand-sheet by filtration through a Büchner funnel and subsequent drying in a Rapid-Köthen sheet former at 60° C. and 720 mm. mercury. The whiteness is measured with a Leucometer according to TGL specifications. Using seven different fiber fur-

nishes, the whiteness was generally found to increase with increasing sheet dryness, faster in the high-moisture than in the low-moisture region. The final degree of whiteness was reached by chemical pulps (bleached and unbleached sulfite, bleached kraft and straw kraft) at 50-60%, by bleached groundwood and textile-fiber pulp at 70%, and by unbleached groundwood at 80% dryness. Correction factors and diagrams can be established according to individual mill conditions (process water, pressure in the press section, and drying conditions). C.L.B.

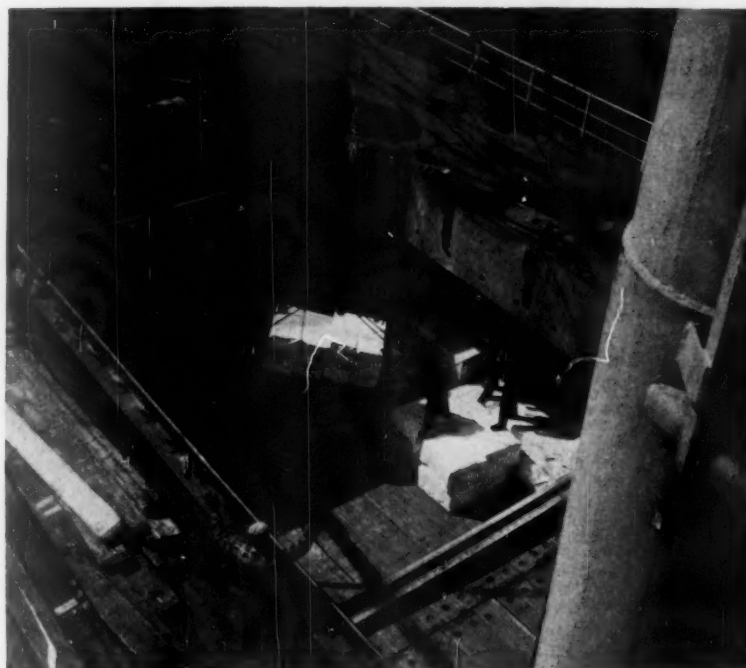
Enzymatic Degradation—Germany

GROHN, HANS, and SCHIERBAUM, FRITZ. Holzforschung 12, no. 3: 65-73 (July, 1958). [In German; English summary] Abstr. Bull. Inst. Paper Chem. 29: 423.

Up to 34% of spruce- and poplar-wood and 7% of spruce sulfite pulp become soluble in cold water on dry milling in a vibratory ball mill; at the same time, the cellulose contents decrease by 42-44 and 36%, respectively, the wood polyoses are doubled (by virtue of the mechanically activated hydrolysis of cellulose chains), and the lignin content remains unchanged. Separation of the milled wood into a water-soluble and an insoluble fraction makes possible a differential degradation by extracellular enzymes of *Aspergillus oryzae*. Degradation of the water-soluble fraction (measured by the decrease in relative initial viscosity) occurs largely within the first 24 hr., whereas the reducing power (toward sodium hypiodite) increases more slowly, reaching its maximum after 2-5 days. Paper chromatography of the enzymatically degraded milled-wood fractions shows much larger amounts of glucose, as compared with those obtained by prehydrolysis of unmilled wood. The three-stage action of the same enzymes on the water-insoluble fraction of milled wood degrades only up to 20% of the original material, the greatest degradation (45%) being suffered by the wood polyoses, as compared with only 15% of the cellulose and 8% of the lignin (by solubilization of fractions associated chemically or physically with the degraded cellulose fraction). On the whole, 54% of the original wood substance is degraded by vibratory ball milling plus cold-water extraction and enzymatic action. C.L.B.

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Gaspesia pulp has earned endorsement for many uses—from *papeteries* to *boxboard* to *tissues*. Among its characteristics: high opacity, high brightness, good strength, excellent bulk and trouble-free working properties.

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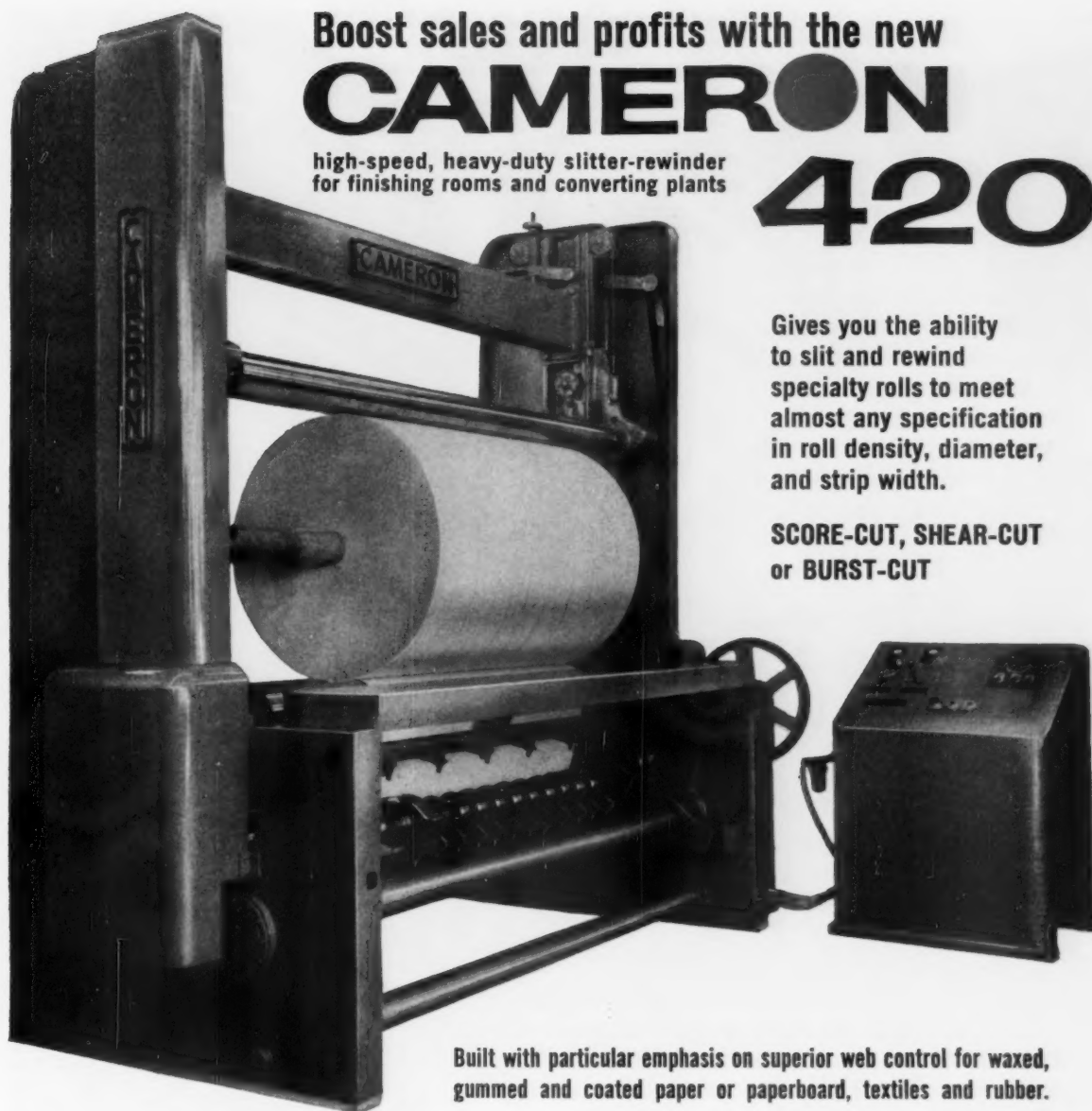
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53 years devoted exclusively to the design and manufacture of slitting, roll winding and unwinding equipment.



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INCORPORATED
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HERCULES

In the chips—with a 5-to-2 pay-off

This Southern papermaker's elevator belt just couldn't stand up under the mountains of pine chips. Its cover softened up under their resin attack. It stretched and needed constant take-ups. And, after just one year, it had to be cut and respliced. 160 tons more pulp could have been processed in the time lost. At the two-year time mark, the belt failed completely.

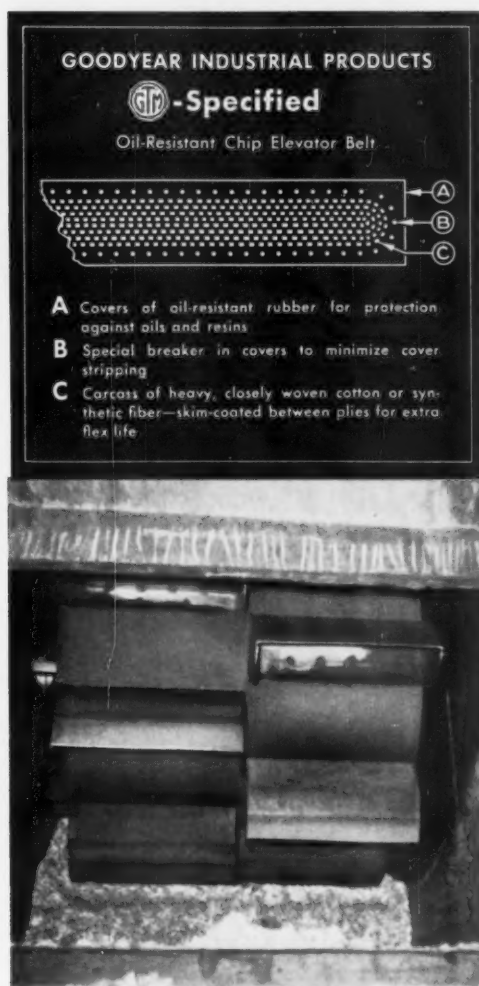
Clearly, something had to be done. A belting specialist, the G.T.M.—Goodyear Technical Man—was called in. His recommendation: a special belt with oil-resistant cover of CHEMIGUM—sure-fire protection against the effects of pine oils and resins.

The results were quickly apparent. Operating 24 hours a day, the G.T.M.'s belt *never lost a minute*

due to belt failure. It put in a full 5 years of service. Even then, it had plenty of life left when an accident tore it in two.

And that's just one more example of the way the G.T.M. and his industrial rubber products come through when the chips are down. To contact him—for full information on them—call your Goodyear Distributor or write: Goodyear, Industrial Products Division, Akron 16, Ohio.

IT'S SMART TO DO BUSINESS with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and non-rubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."



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ACCOSTRENGTH RESIN 2386 is easy to use, too. Doesn't create foam...helps carry more water (better sheet formation)...improves drying...permits substitution of hardwood for pine...raises tensile and bursting strength, with better folding endurance. Dimensional stability goes up, too!

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"flows" over your felt rolls with no abrupt bending action. This assures a smooth running, long lasting seam.

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* NOTE SERPENTINE STITCHING TO EQUALIZE FELT PULL

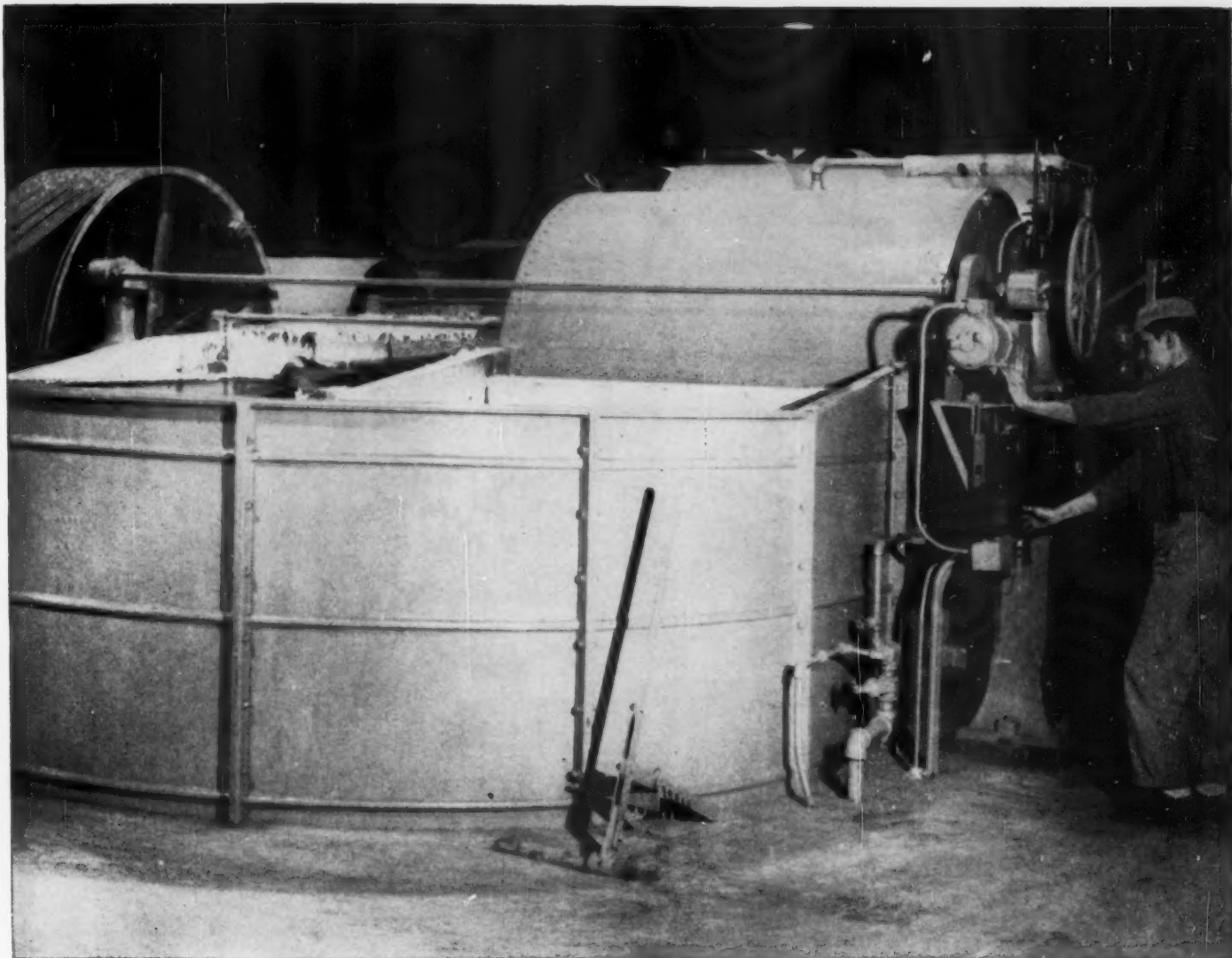
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Stainless Steel keeps pulp clean

If you want bright, spotless paper, you have to keep the *pulp* spotless. In the beater shown here, that's a tough job. The pulp is like wet blotting paper. It can pick up the smallest speck of dirt, rust or corrosion. Yet the pulp stays clean because the beater is lined with Stainless Steel.

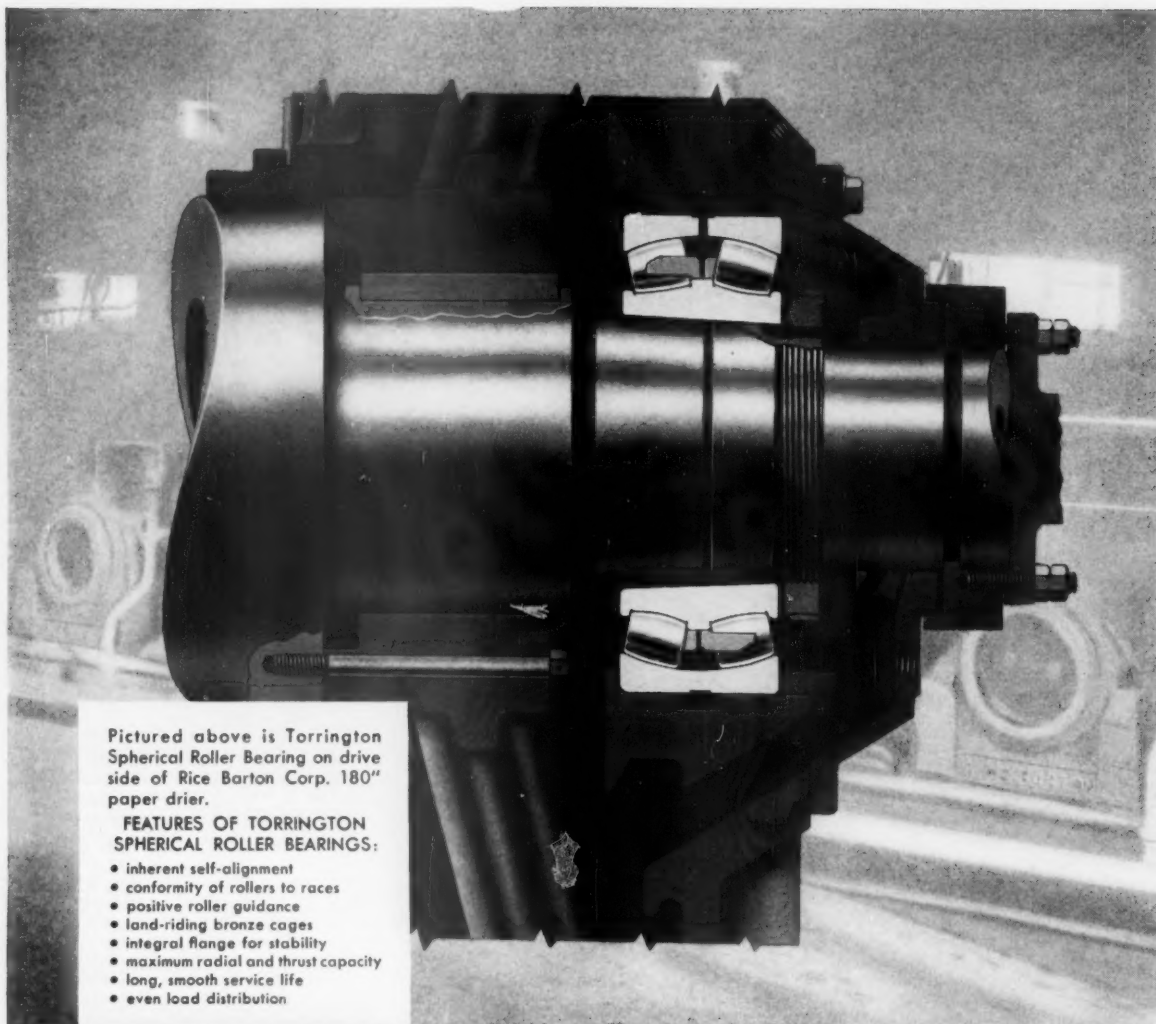
Unlike many other metals, Stainless Steel resists pitting and corrosion from chemicals used in papermaking. There is no pitting and there are no flakes of corroded metal to foul the pulp. And because the dense Stainless Steel surface is so easy to clean between batches, there's no danger of color carry-over to affect new colors.

When you install new equipment in your plant, specify corrosion-resistant Stainless Steel. It lasts years longer on the toughest jobs.

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American Steel & Wire - Cleveland
National Tube - Pittsburgh
Columbia-Geneva Steel - San Francisco
Tennessee Coal & Iron - Fairfield, Alabama
United States Steel Supply - Steel Service Centers
United States Steel Export Company



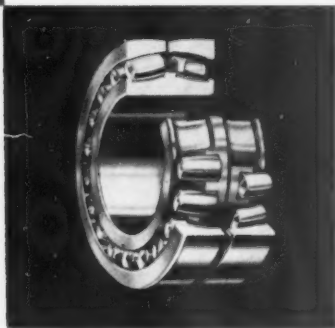
United States Steel



Pictured above is Torrington Spherical Roller Bearing on drive side of Rice Barton Corp. 180" paper drier.

FEATURES OF TORRINGTON SPHERICAL ROLLER BEARINGS:

- inherent self-alignment
- conformity of rollers to races
- positive roller guidance
- land-riding bronze cages
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smooth drier performance*

Torrington Spherical Roller Bearings provide self-alignment across the 180"-face Rice Barton Corp. paper driers to assure Kalamazoo Paper Company smooth drier operation. They are used in drive and tending sides.

Uniform loading for both roller paths is secured by accurate geometrical conformity of races to rollers and through positive roller guidance against the integral center flange. Further assurance of long bearing life is Torrington's use of finest quality electric furnace alloy steel and the most advanced metallurgical methods.

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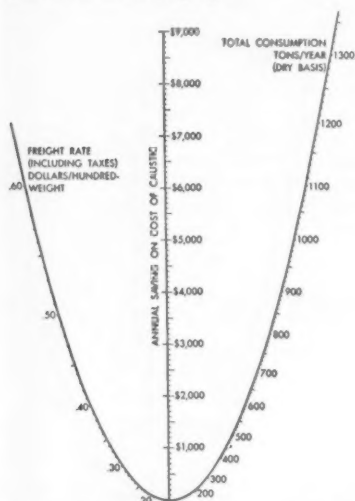
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On which is better for you — 50% or 73% caustic soda... some tips on choosing a supplier... a new source of caustic soda

50% to 73%— some save, some don't

To estimate quickly whether you can save by switching from 50% to 73% liquid caustic soda, simply draw a line on this nomograph.



Start at your freight rate and draw to your annual consumption in tons, dry basis. Your approximate savings on freight will appear where you intersect the center line.

From this figure, subtract annual depreciation for dilution equipment. (We'll be glad to advise you on cost of this equipment.)

If you still show a saving, it would be wise to consider the big switch seriously.

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And for specific technical advice centered on *your* requirements, just phone or write the nearest Hooker sales office.

Choosing a supplier

Service is a large part of what you pay for when you buy caustic soda.

Here are some important "service" points to look for when you're considering a source of supply. (As a Hooker customer, you enjoy *all* of them.)

1. Supply security. How flexible are your supply lines? For instance, a supplier with plants and stock points on deep water may be able to offer you a choice of rail or water delivery. This can assure you steady supply in case of rail service interruption.

2. Realistic contracting. Your agreements with your supplier should realistically reflect your expected needs *and* the supplier's ability to consistently deliver the tonnage you need. Best yardstick for measuring this ability is a supplier's performance record. Hooker, for example, has an unbroken 50-year record of fulfilling contract commitments.

3. Engineering help. A supplier's engineering staff can help you set up a new caustic handling system—or re-vamp an old one—with advice, and with actual design assistance.

4. Safety programs. The men in your plant who handle caustic soda can benefit from safety suggestions offered by your supplier. You should have on tap the latest in safety equipment, plus up-to-date information on the safe handling of caustic soda.

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- ☐ Technical data on caustic soda.

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- ☐ Sodium Chlorate
- ☐ Sodium Sulfide
- ☐ Sodium Sulphydrate

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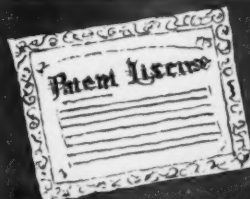
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Well, perhaps there's a little more to your gaining use of Becco patents than just mailing your dollar in, but not much more. And certainly, no more money. The \$1.00 really does cover it.

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If one of our patents can help you, we'll be glad to license the rights to you **perpetually**, for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important — you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

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Years of experience in paper and pulp processing have produced a library of technical information which is available in individual bulletins, free on request. Use the coupon below to let us know which you'd like to receive.

- No. 31 — Groundwood Bleaching Variables — A Statistical Approach.
- No. 32 — H_2O_2 Bleaching of Chemicals and Mechanical Pulps.
- No. 47 — Peroxide Bleaching of Pulps.
- No. 48 — High-Density Pulp Bleaching.
- No. 64 — Development Studies on Last-Stage H_2O_2 Bleaching of Alkaline Pulps.
- No. 65 — Peroxide Bleaching of Southern Pulps.
- No. 66 — Becco Laboratory Procedures for Pulp Bleaching, 1955 Ed.
- No. 91 — Peroxide Bleaching of Chemi-Mechanical Hardwood Pulps.
- No. 92 — Peroxide Bleaching of Chemical Pulps.

New Cold Caustic Bleach Process

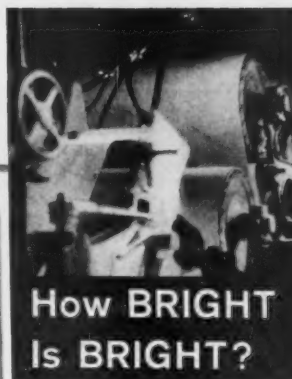
Looking for a way to use greater amounts of low-cost, more plentiful pulp—without capital investment for bleach equipment? Then let a Becco Sales Engineer show you our new technique* which allows you to bleach in the same equipment regularly used for the manufacture of cold caustic pulp.

In this new process, peroxide bleach liquor is added at the Bauer Refiner, and bleaching occurs during the refining operation. Bleach response depends on refiner densities.

Up to 20 points brightness increase has been obtained in commercial operations to date, and with no additional steam costs, no holding time, and no excessive chemical costs.

Becco can assist you immediately in setting up a production run and evaluating results. First step: use the coupon to let us know you're interested.

*—Patent Pending



How BRIGHT Is BRIGHT?

That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level improves to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with all types of pulp. If you'd like help with your pulp, free of any obligation, let us know with the coupon below.

BECCO



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BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York

Gentlemen: Dept. PP-G
Please send me a copy of each of the following bulletins:

NAME _____
FIRM _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York

Gentlemen: Dept. PP-H
Please have a Sales Engineer give me more information on Becco's Cold Caustic Bleach Process.

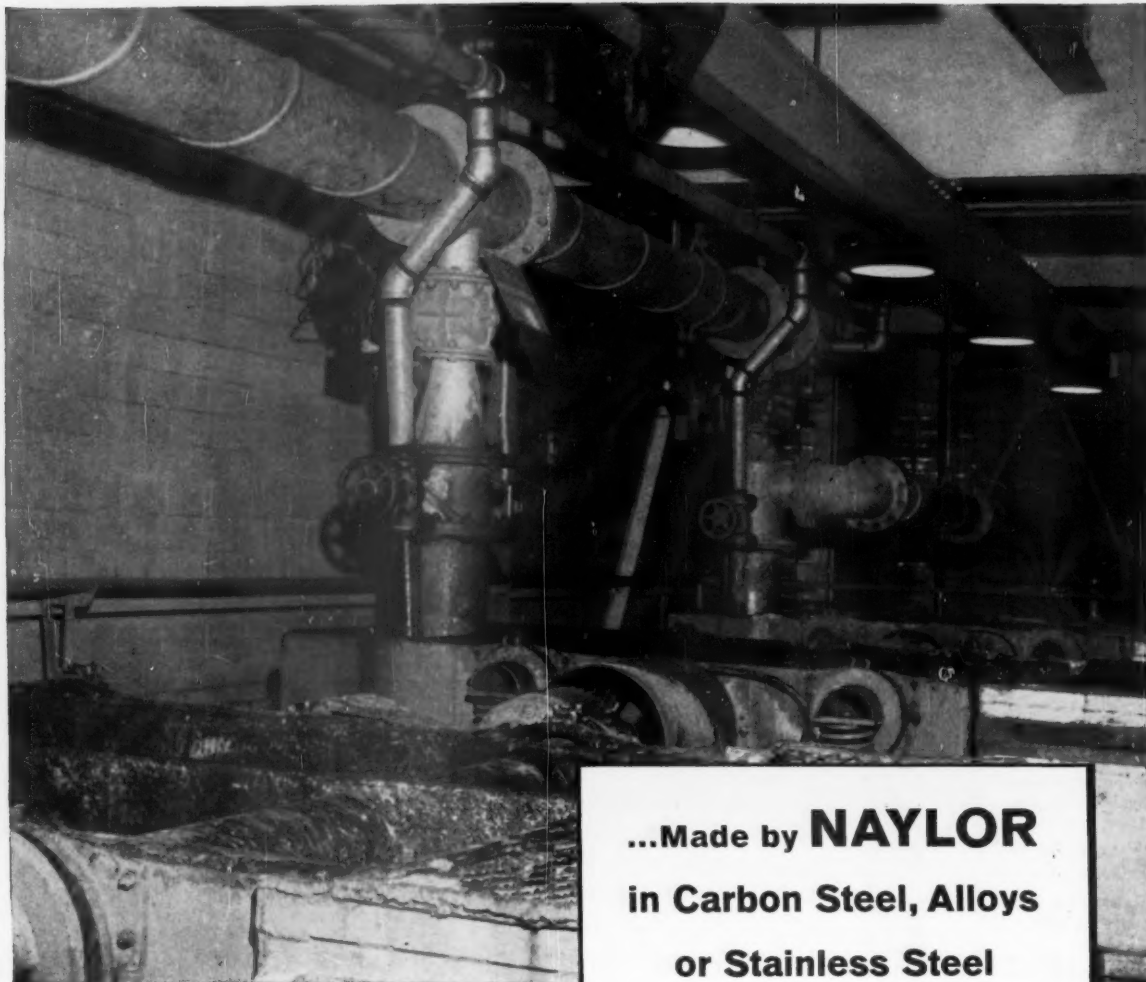
NAME _____
FIRM _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York

Gentlemen: Dept. PP-C
We would like help with our pulp. Please have a Becco Sales Engineer call.

NAME _____
FIRM _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

PIPING FABRICATIONS



...Made by **NAYLOR**
in Carbon Steel, Alloys
or Stainless Steel

NAYLOR fabrication service can meet your paper mill piping requirements economically—no matter how exacting your specifications may be.

NAYLOR Spiralweld pipe is fabricated from carbon steel, alloys and stainless

steel, in sizes from 4" to 30" in diameter and thicknesses from 14 to 8 gauge. Pipe, fittings and flanges are available from stock.

Write for new Bulletin No. 59 and send specifications for quotation.



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on heavy paper*



*Book with identical
contents printed on
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makes the difference

GET HEAVY-PAPER OPACITY IN THIN PAPERS WITH

*Thin papers are fast replacing heavy papers in many types of books and publications, thanks to the excellent opacity and printability imparted by titanium dioxide. And Cyanamid's UNITANE O-110 is unsurpassed for achieving whiteness, brightness and opacity *economically*. As little as 3 per cent in a 15-pound stock can boost opacity by more than 25 per cent...can boost sales substantially, too!

This popular anatase titanium dioxide features particle fineness, good dispersion, high refractive index and pleasing color tone. It enables you to meet a wide range of customer specifications for opacity, whiteness and brightness in air mail, Bible, catalog and other thin papers.

For sales-building quality in *your* papers specify UNITANE titanium dioxide. Your Cyanamid Pigments representative will gladly review your requirements and recommend the type of UNITANE best suited to meet them.

UNITANE® O-110

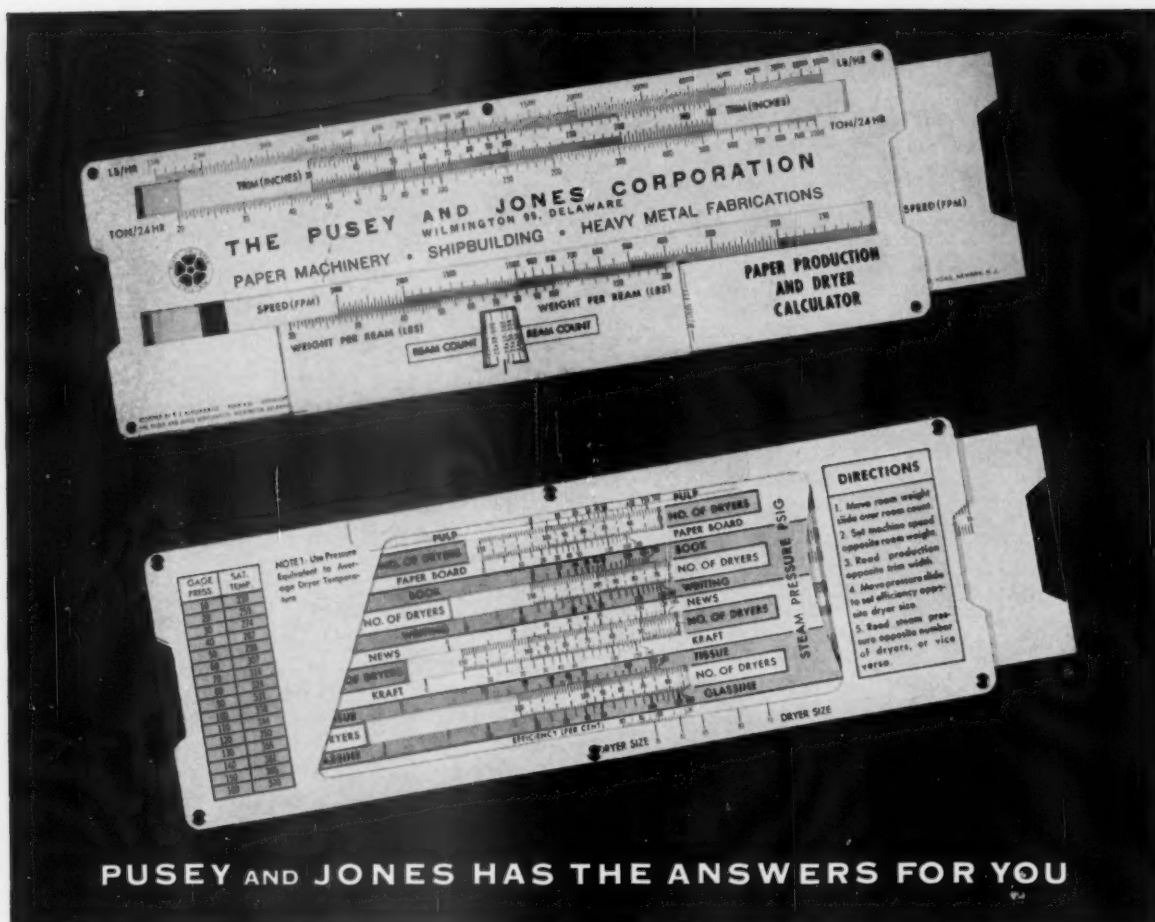
TITANIUM DIOXIDE

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Branch Offices and Warehouses
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PUSEY AND JONES HAS THE ANSWERS FOR YOU

With Pusey and Jones' new free Calculator you can do a fast, accurate job of figuring ream counts, dryer size, type of paper and other mill data.

Just fill out the coupon—it will bring you Pusey and Jones' new Paper Production and Dryer Calculator—a new kind of slide rule that will save you many hours in your day-by-day mill operations.

It's easy to use, sturdily constructed and convenient—measures only 9½ inches by 3¼! Not for sale anywhere, it's available *only* from the first company in the United States to specialize in the design and manufacture of paper-making machines. See a Pusey and Jones representative or write direct.

What you can do* with PUSEY AND JONES'
NEW PAPER PRODUCTION AND DRYER CALCULATOR:

| Figure This: | When You Know: |
|--|--|
| Daily and hourly production | Ream weight and count, speed and trim |
| Equivalent ream weight | Both ream counts |
| Speed | Desired production, any ream weight-count combination and trim |
| Number of dryers needed in a new machine | Weight, ream count, speed, type of paper and steam pressure |
| Dryer efficiency in your present machine | |
| Extra dryers or increased steam pressure required in rebuilding for greater production, change of speed, different weight or conversion to another type of paper | |

*At least 8 different calculations can be made quickly and easily. Above calculations may be reversed or altered depending on knowns and unknowns.

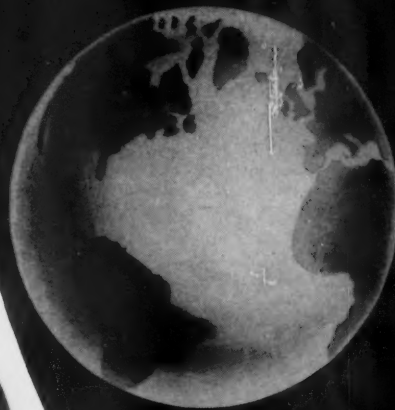
Please send one of your new Paper Production and Dryer Calculators.

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STREET ADDRESS _____
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**THE
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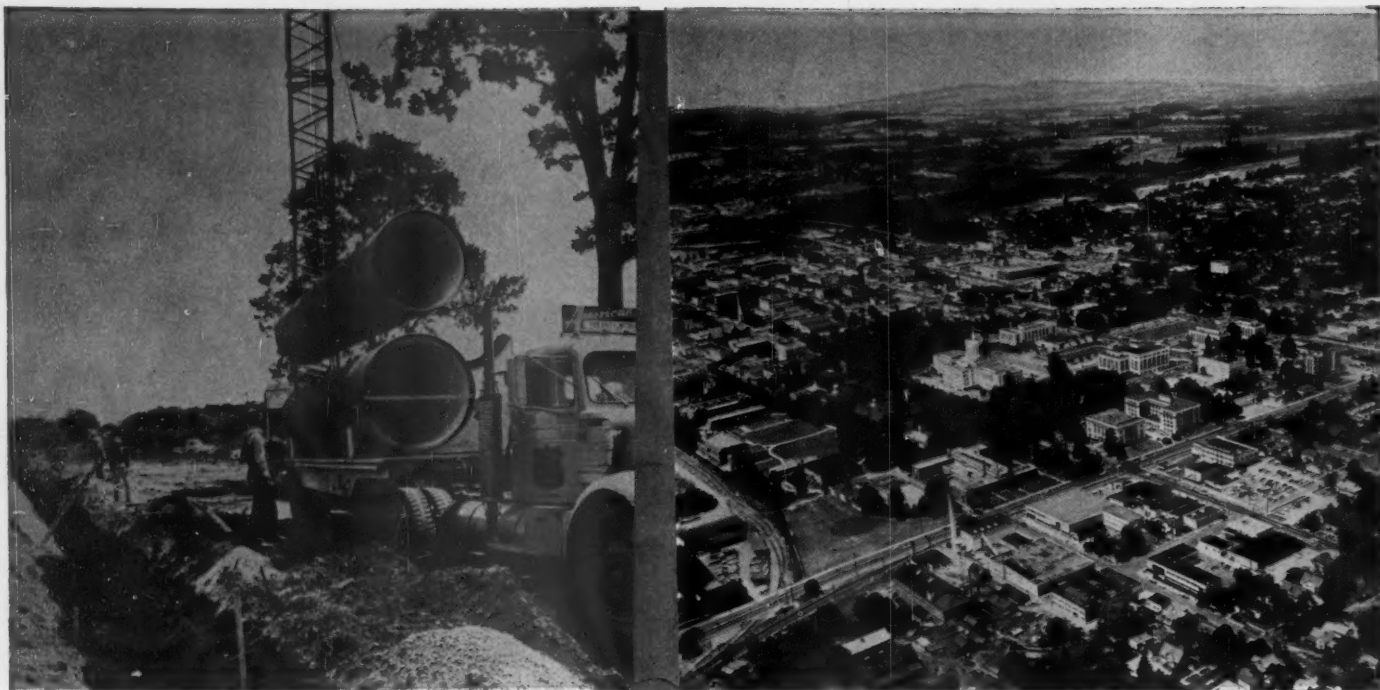
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in 60 cities in the United States,
Europe, Latin America,
Africa, and Asia.

PAPER



BULKLEY DUNTON
ORGANIZATION



New Salem pipe line to augment present system will add approximately 50 MGD capacity to city water supply system.

a line of growth...

for Oregon's capital city

*American Concrete Cylinder Pipe
is helping Salem, Oregon to grow*

A simple but important fact is that no city, however great its potential, can grow beyond the capacity and dependability of its main water supply system.

Recognizing this fact, and envisioning a population in 30 years that will require three times the maximum capacity of present water transmission lines, Salem, the capital city of Oregon, is carrying out a program designed to meet future needs.

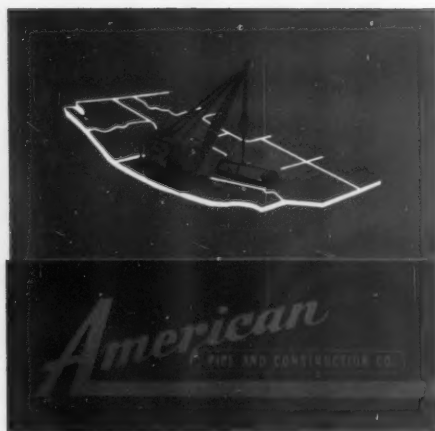
Under the direction of the City's Water Department Manager, John L. Geren, and the technical supervision of Consulting Engineers Clark and Groff of Salem, an 18-mile pipe line of 48" and 54" diameter American Concrete Cylinder Pipe is being installed by Lord Brothers, a general contracting firm of Portland, Oregon. This new line will triple the present capacity of the supply system.

The performance record of this type of reinforced concrete cylinder pipe has been so outstanding throughout the West that Salem can be confident that this water "growth line" will be giving efficient, economical service for many, many years to come.

Strength, permanence, sustained high carrying capacity, and trouble-free service are characteristics of American Concrete Cylinder Pipe which make it the right pipe for this forward looking city.

When planning your future water "growth lines," look to American's quality pipe line products, extensive production facilities and half century of experience.

Ask for complete information concerning the particular class of pipe that will meet your design requirements.



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Courtesy: The Glidden Company, Paint Division, Manufacturers of SPREDSATIN Latex Paint

Alpha[®] Protein...

for whiter, smoother, more uniform coated offset paper

Pure white, shades of white and modeling in white demand faithful reproduction. Your customers can be *sure* with Alpha Protein-processed paper.

Alpha Protein improves whiteness and opacity, gives the smooth, uniform surface required for the detailed reproduction of fine-screen halftones with maximum brilliance, depth and clarity.

Coating mill operators report that the extra solids possible with Alpha Protein give production increases as great as 15 percent. More solids mean faster drying, allow faster machine speeds and higher coat weights.

Write or call for detailed information.

CENTRAL SOYA COMPANY, INC.

Chemurgy Division

1825 N. Laramie Avenue • Chicago 39, Illinois

This advertisement reproduced on Alpha Protein-processed paper

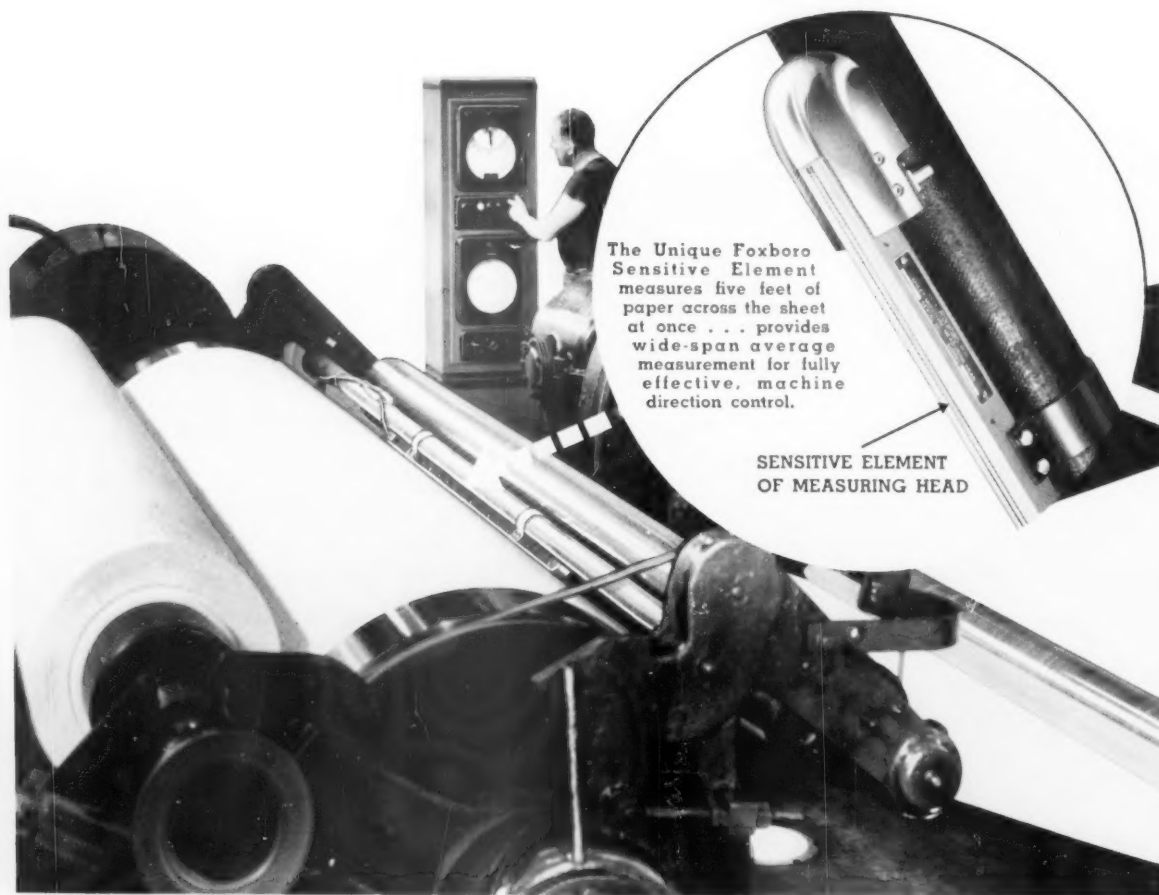
72 Leading Mills

set new records in sheet moisture uniformity
... with **FOXBORO** control

Seventy-two leading mills, ranging from Bangor to Los Angeles, are now using Foxboro Sheet Moisture Control to maintain the closest sheet moisture uniformity they've ever had! With Foxboro Control they're now automatically getting: 1. *Direct* measurement of sheet moisture at the reel...fast, precise control of steam to the dryers. 2. *True* average reading across as much of the sheet as desired. 3. Consistent high accuracy independent of sheet temperature or speed. 4. Complete protection against dryer overheating during sheet

breaks. 5. Ability to control moisture of any weight stock: tissue, pulp, kraft, newsprint, board, or specialties. It's the *complete* control system that's helping them to make better paper at lower cost.

Foxboro Sheet Moisture Control can improve your paper quality...eliminate costly rejects...help you to ship paper at precisely the specified moisture content. Get full details. Write for illustrated Bulletin 10-4. **The Foxboro Company, 992 Neponset Ave., Foxboro, Massachusetts, U. S. A.**













FOXBORO



Reg. U.S. Pat. Off.




AUTOMATIC SHEET MOISTURE CONTROL

How to cut lubricant costs up to 90% — and increase production!

Large and small plants  in many industries are making important maintenance savings  while actually boosting machine output— with Alemite Oil-Mist  Automatic Lubrication.

The Oil-Mist system atomizes oil into air-borne particles,  carries them through tubing to all lubrication points  and bathes every moving surface with a cool film of clean lubricant  while machines operate. It provides constant, uniform, completely automatic  lubrication to a few or to hundreds of bearings.  Accurate and foolproof, Oil-Mist eliminates guesswork.  No bearing can be overlooked  or over-lubricated.

Three types of Oil-Mist fittings apply lubricant in the form required. Either a mist fitting  or a condensing fitting  is used to lubricate any lubrication point.

An Oil-Mist system  can be applied to any new or installed machine.  Find out in detail how it cuts costs,  reduces man-hours and machine downtime, extends bearing life, and increases production.

Write  Alemite, Dept. QQ-29, 1850 Diversey Parkway, Chicago 14, Illinois.

Makers of these automatic centralized lubrication systems: Oil Mist • Accumatic • Accumite

1850 Diversey Parkway,
Chicago 14, Illinois



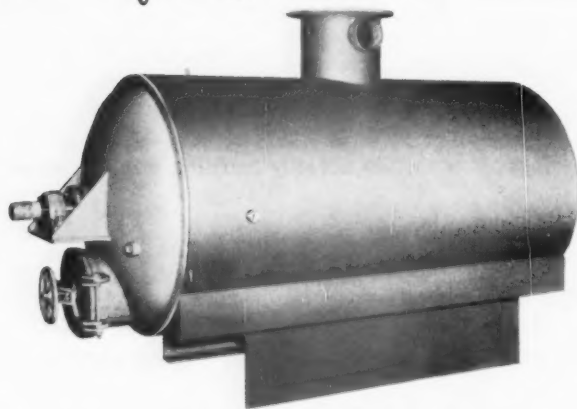
FELKER BROS. MFG. COMPANY

Metal Fabricators for OVER 50 YEARS

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FELKERWELD
for Endurance



- A Pressure Cooker of open hearth mild steel fabricated to customer specifications.

ASME Code

Our shop is qualified for construction under the A S M E Code for unfired pressure vessels to current code requirements.



- FELKERWELD plug type CLEAN OUTS with quick opening Vee Grip Flange.

We invite inquiries on any Fabricated Products ... write, phone or wire ... estimates promptly furnished. Ask for our Bulletin No. 505.

Our more than 50 years' experience in fabricating plain steel, applied to stainless steel when it came into the market enabled us to develop our FELKERWELD PROCESS for ENDURANCE, with such metals as Stainless Steel, Stainless Clad Steel, Inconel, Monel, Nickel, Copper and Aluminum Bronze. FELKERWELD is your guarantee for quality workmanship.

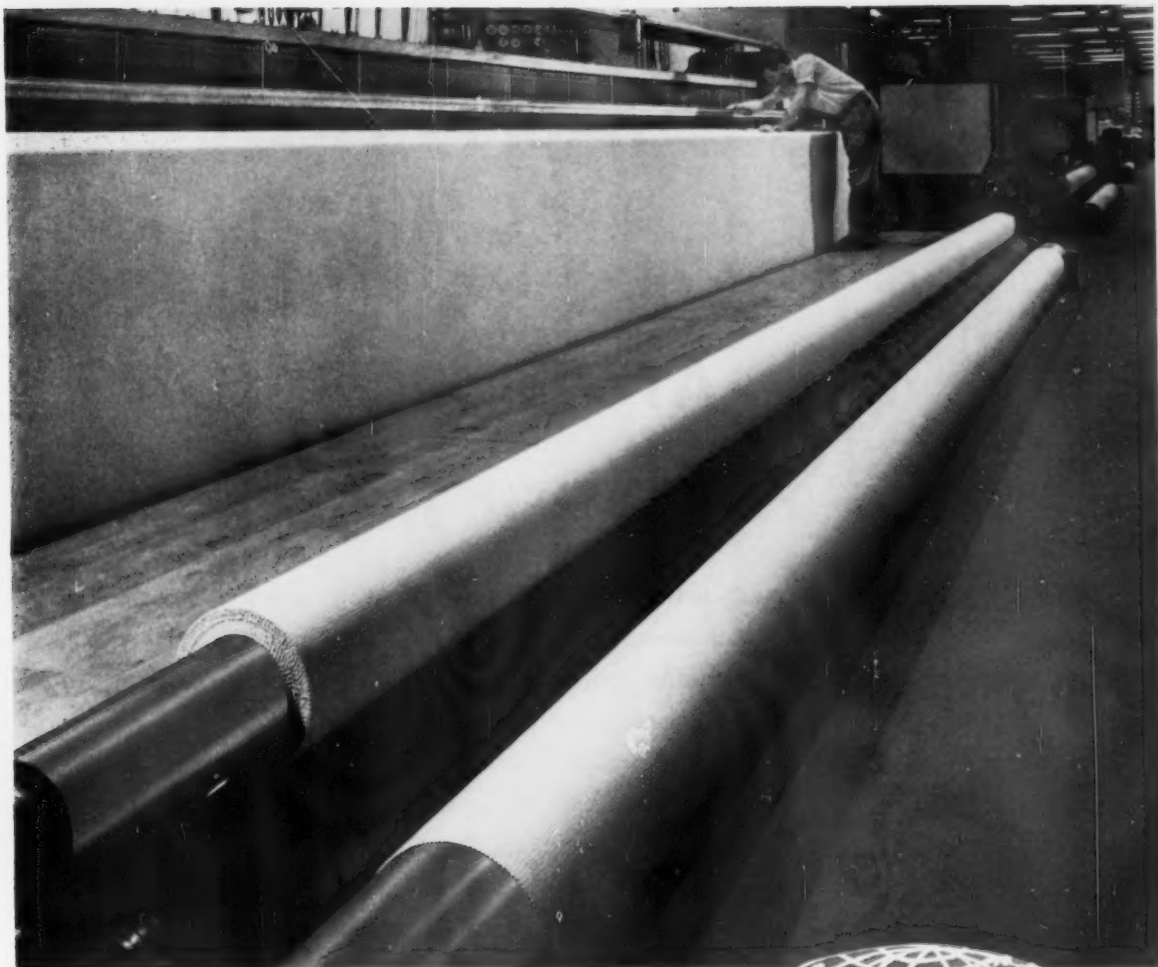
We Fabricate
to Your
SPECIFICATIONS



- FREEFLOW Type Stainless Steel Elbows —Fittings available in all metals.

FELKER BROTHERS MANUFACTURING CO.

PHONES 230-231 MARSHFIELD, WIS.



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... and flawless quality every inch of the way!

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This specially engineered Brandon loom can weave the widest dryer felts in the world. From wide to narrow, Brandon makes felts to fit any paper-making machine in existence today. Custom woven from natural fibres, or combinations of natural and synthetic fibres, Brandon Dryer Felts are fully preconditioned for dimensional stability and fitted with clipper seams for easy installation. Look for the blue Brandon emblem . . . hallmark of the world's finest quality in dryer felts.



BRANDON **DRYER FELTS**

For information, write:

BRANDON SALES, INC., BRANWOOD STATION, GREENVILLE, S.C.

IMPCO OFFERS COMPLETE BROKE PULPING AT ALL POSITIONS ON YOUR PAPER MACHINE

Over two thousand Impco Agitators for every conceivable mill requirement, both before and after the paper machine, are in successful operation. As a pioneer in the designing of such equipment, Impco also regularly builds broke handling devices for various positions under the paper machine. Consequently, such units as Couch Pit Agitators, Sheet and Roped Press Broke Shredders, Dry Sheet Shredders, Solvo Pulpers and Defiberers have been developed. As a result of this mill proven experience, Impco can provide you with either a complete broke handling system or individual components.



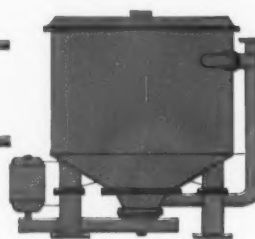
Press Broke
Shredder



Weedless Repulper



Dry Sheet Shredder



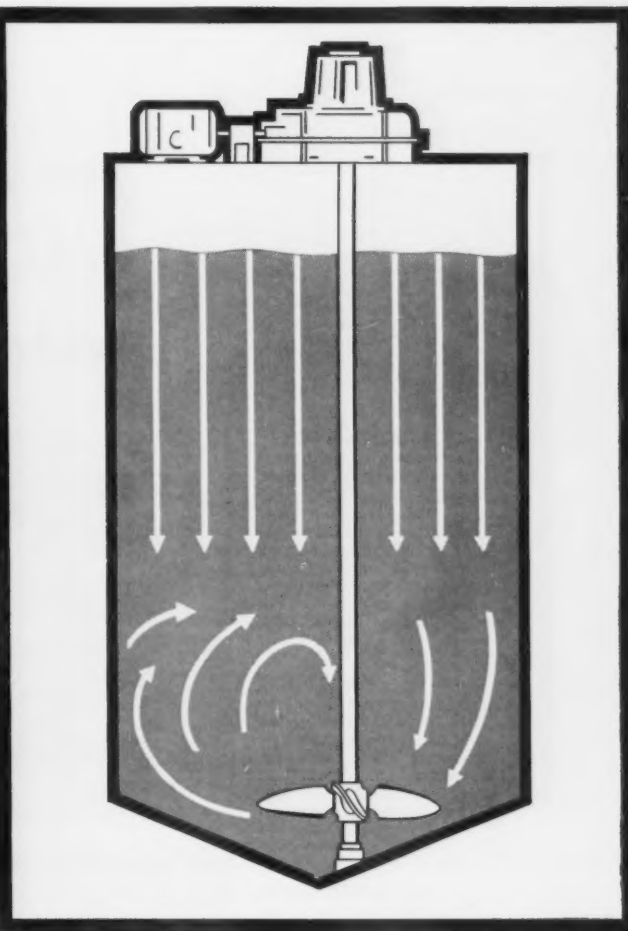
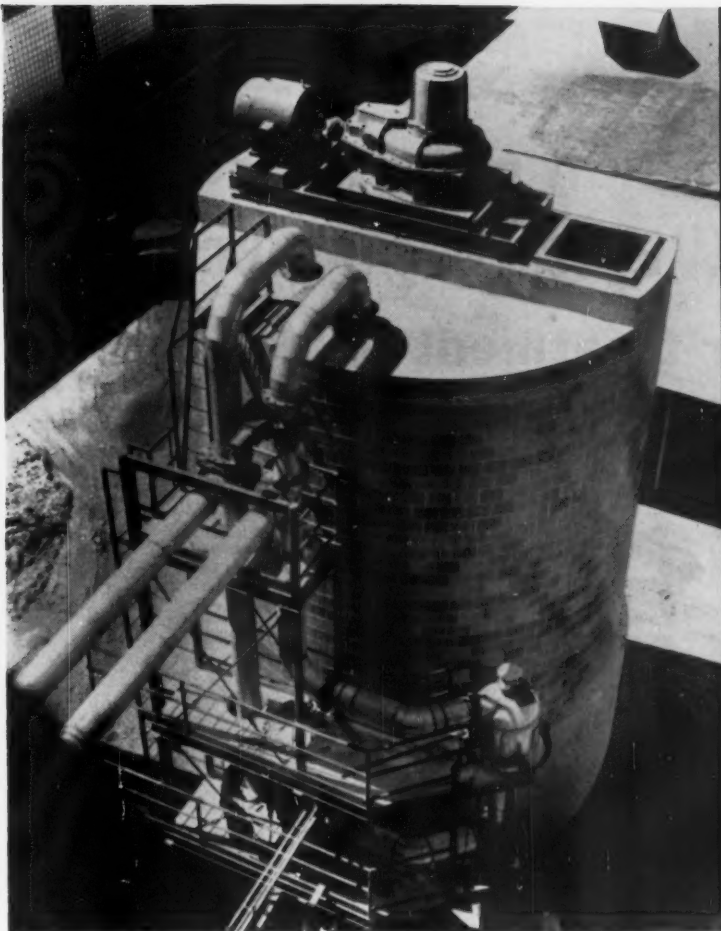
Solvo Pulper



**IMPROVED
MACHINERY INC.**

NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec



How to spot a stock fluctuation before it happens

Engineers have found a fast, sure new way to get stock ready for its trip through St. Regis Paper Company's big mill at Pensacola, Fla.

Heavy stock—averaging 6%—moves out of this storage chest at a consistency that's uniform and *known in advance*.

There are no sudden up-and-down swings. Feed stock fluctuations that occur are smoothed out—end result is a fully predictable effluent. Thus it's easier for mill engineers to control the entire highly automated circuit through which the stock flows on its way to the machine.

How does it work? Sitting on top of the chest is a LIGHTNIN Mixer that develops 200 horsepower. A steel shaft reaches 28 feet down into the chest's cone bottom, where a fast-turning 8-foot diameter propeller gives the heavy stock a powerful churning.

Mixing takes place in a sharply-defined zone in the bot-

tom third of the unbaffled chest. Within this controlled zone, stock is fully uniform. Above the agitated zone, stock is relatively motionless, but it moves in a definite plug-like flow into the agitated zone as mixed stock is drawn off. Time cycle and flow path of all stock—mixed and unmixed—are completely predictable.

How you can apply it. Wherever you want uniform stock to help your mill system run efficiently, you can get it with LIGHTNIN Mixers in your chests or tanks.

You get the precise power level you need to accomplish the job you want done within a given time. Results are guaranteed.

To get the facts on this tight-control stock mixing method, now working effectively in more than 100 mills, call in your LIGHTNIN Mixer representative (listed in Thomas' Register). Or write us today.

**Lightnin®
Mixers**

MIXCO fluid mixing specialists

GET THIS NEW BULLETIN

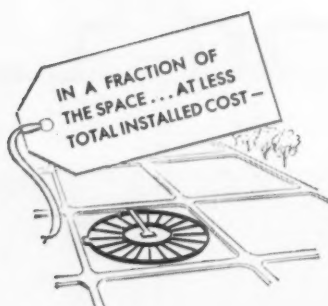
- ☐ "Agitation and Mixing for Pulp and Paper Mills." Complete, helpful information on agitation of stock, pulping liquors, coating slurries, and on waste treatment (B-511)

Ask also for these illustrated bulletins describing LIGHTNIN Mixers:

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| <input type="checkbox"/> Laboratory and small-batch production types (B-112) | <input type="checkbox"/> Portable: ¼ to 3 HP (B-108) |
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Check, clip and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 141-b Mt. Read Blvd., Rochester 3, N.Y.
In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.



you get **HIGH** performance...
at **LOW** cost... *with* **INFILCO**
water treatment equipment

ACCELATOR®

high rate treatment plant
 ... saves up to 80% of space

Clarifies, or softens and stabilizes water in a single basin; replaces slow rate separate mixing, coagulation and sedimentation basins. Produces clearer, more stable effluent; "slurry contact", not "sludge blanket" unit.

Bulletin 1825

FILTERS

Complete equipment for gravity filters, including meters, rate controllers, control panels or operating tables. Design for your particular needs based on years of experience.

Pressure filters, too, for plants of smaller capacity.
 Request Information

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For simple clarification by sedimentation. Type WS for smaller diameters. Type BF for larger diameters. Three different types of surface skimmers available, depending on operating conditions.

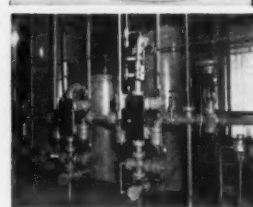
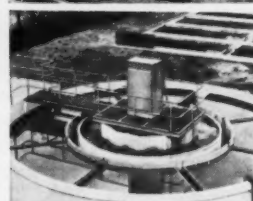
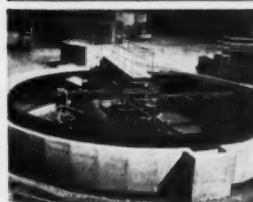
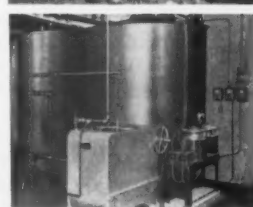
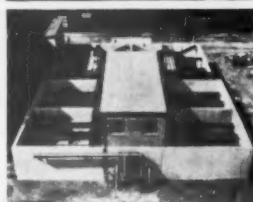
Bulletin 6000

ACCELAPAK®

TREATING PLANT
 for producing potable water in plants or woodlands

Removes objectionable turbidity, organic matter, iron, taste, odor. Delivers purified and clarified water. Economical to operate.

Bulletin 1870



CYCLATOR® CLARIFIER

... saves valuable space

... recovers water and fibre
 Clarifies white water and mill effluents by chemical and mechanical methods with solids recirculation in a single unit. Combines all functions in a single basin.

Bulletin 850

SEDFLOTOR® Saveall

Where space is limited and high-rate clarification a must, this air flotation unit is ideal for removing both floatable materials and settleable solids.

Bulletin 6051

AERO-ACCELATOR® (TRADE-MARK)

TREATING PLANT
 ... a compact, efficient activated sludge plant

High-rate, multipurpose unit for B.O.D. reduction of mill effluent. Rapid, continuous biological oxidation and clarification, efficient and stable operation at high loads. Low installed cost.

Bulletin 6510

BOILER FEED- WATER TREATING EQUIPMENT

A complete range of water treating plants custom engineered to meet your particular requirements. ACCELATOR® clarifiers, ACCELATOR® HOT-FLOW® Softeners, Zeolite Softeners and Demineralizers.

Request Information



57481

Specially designed for pulp and paper needs

For pollution control, treatment of process water, and efficient recovery of process water and fibre with economical use of chemicals, minimum space and construction requirements — these are just a few of the advantages of INFILCO treatment equipment. It's the most complete line on the market, with many other units in addition to the typical examples illustrated above.

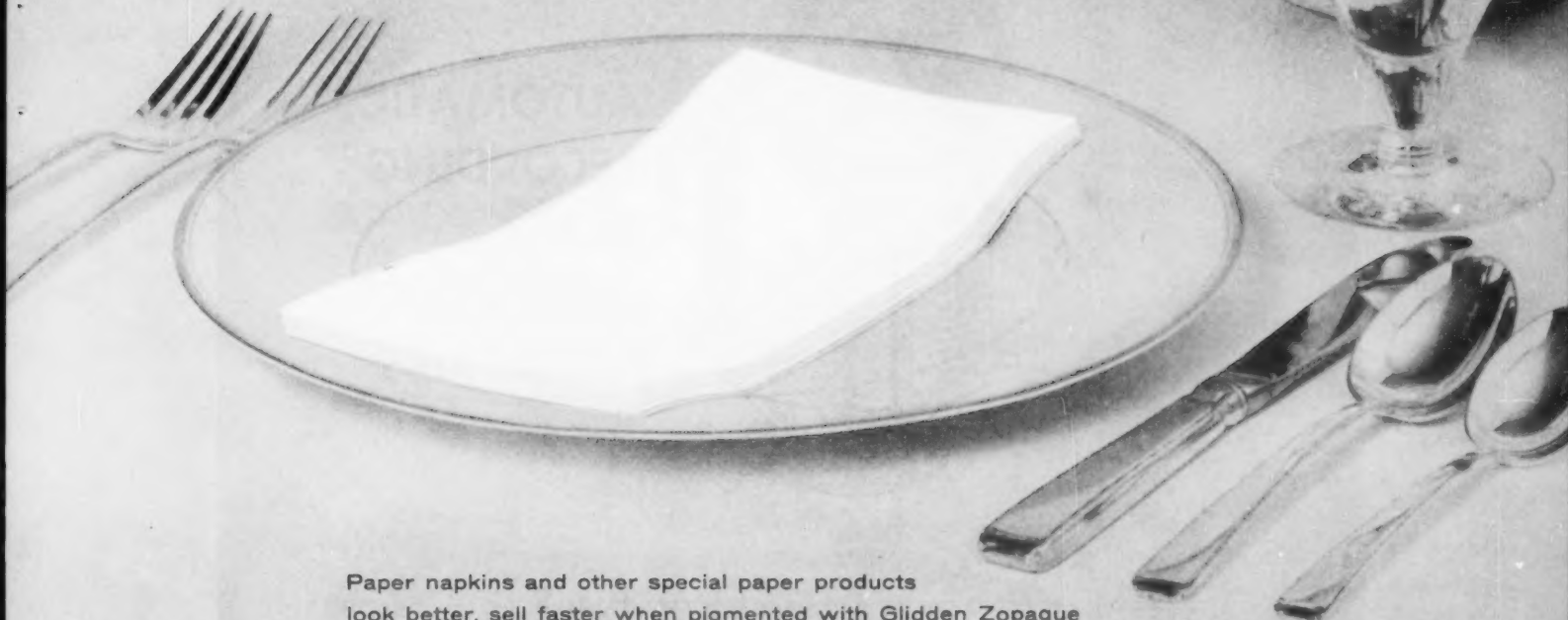
INFILCO engineers know how to help solve your problem with knowledge gained from many years of specialized experience in pulp and paper fields. Write today for bulletins of interest to you.

Inquiries are invited on all problems in the treatment of process and boiler feed water, and of waste water for the pulp and paper industry.

THE ONLY COMPANY impartially offering equipment for ALL types of water and waste conditioning — coagulation, precipitation, sedimentation, flotation, filtration, ion exchange and biological treatment.

FINEST PAPER NAPKINS...

begin with
Glidden Zopaque®
Titanium Dioxide



Paper napkins and other special paper products look better, sell faster when pigmented with Glidden Zopaque Titanium Dioxide—the whitest white pigment available.

Zopaque imparts high opacity, gives maximum whiteness and brightness to any paper product. And the finer, consistently uniform Zopaque particles are readily dispersible.

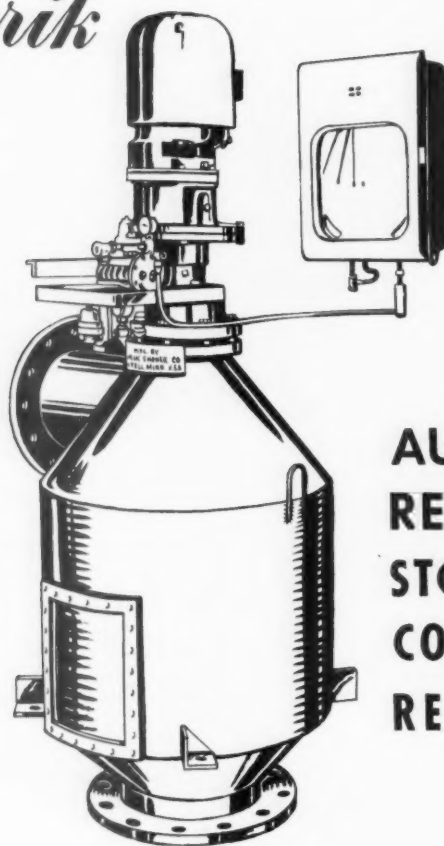
Write for complete details on the grades of Zopaque specially developed for beater addition and coatings.



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The Glidden Company
Chemicals—Pigments—Metals Division
Baltimore 26, Maryland

DeZurik



**AUTOMATIC
RECORDING
STOCK
CONSISTENCY
REGULATORS**

DeZurik Regulators are guaranteed to hold consistencies within limits of plus or minus .1%, yet many of them installed directly ahead of paper machines are holding consistencies to plus or minus .02%! This accuracy . . . this positive performance can be yours on a wide range of installations, such as regulating stock after high density storage chests, after broke pulpers, after stock washers, in stock metering systems, in stock refining systems and others.

Three basic types of DeZurik Regulators are available: Pipe Line Type (illustrated), Pan Type and Open Type. Write for details.

 **DeZURIK**
CORPORATION
SARTELL, MINNESOTA



IS WHITE

Bleached Sulfite Pulp

PUGET SOUND PULP & TIMBER CO.
BELLINGHAM • WASHINGTON

ANOTHER IN A SERIES
OF MOTOR FACTS
FROM ALL INDUSTRIES



Westinghouse motors double normal life for this application

... at Ohio-Apex Div., Food Machinery
and Chemical Corp.

this standard **Life-Line A** motor
still pumping corrosive POC I₃ after 12 continuous months
without maintenance or down time

"We must have a dependable motor, completely sealed and corrosion-resistant," says Mr. Burton Fitch, Ohio-Apex Division of Food Machinery and Chemical Corporation, Nitro, West Virginia. "A corrosive atmosphere, plus phosphorous oxy-chloride drip and seepage, cuts motor life. Westinghouse Life-Line® "A" motors have already passed this replacement point twice ... and are still going strong."

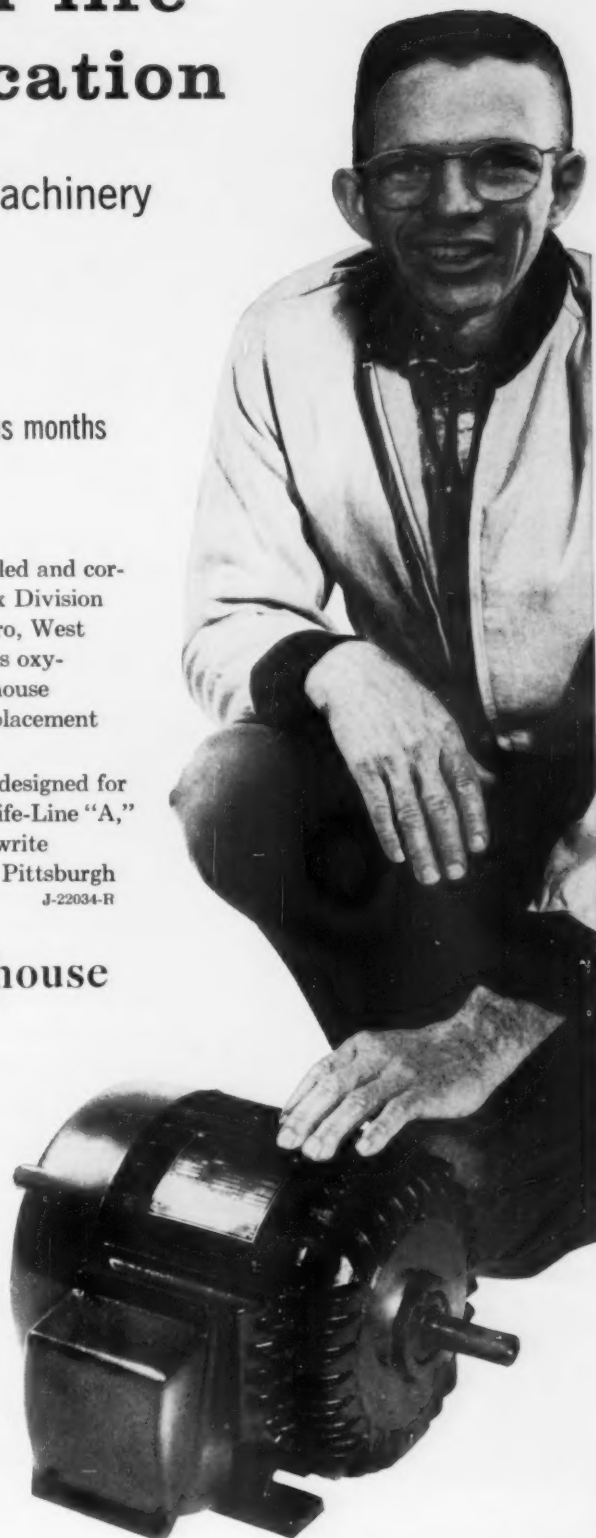
Westinghouse motors last longer because they're designed for modern industry's needs. For more facts about the Life-Line "A," call your local Westinghouse representative ... or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-22034-R

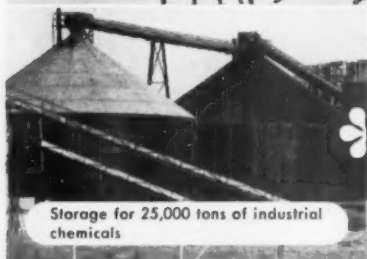
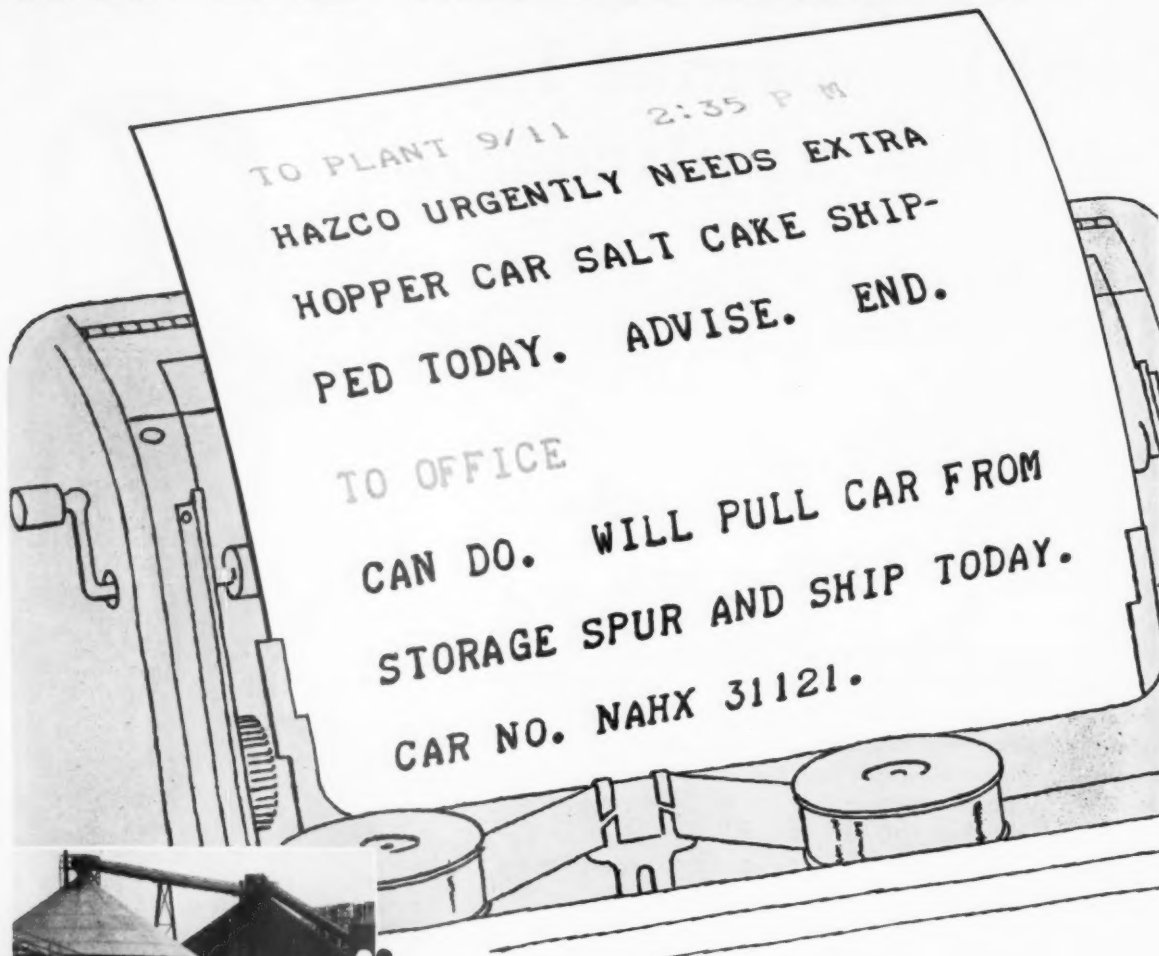
YOU CAN BE SURE...IF IT'S Westinghouse

←
Unretouched photo of Life-Line "A" three-hp motor
driving chemical pump at 1730 rpm, 100 gpm at
Ohio-Apex.

"Westinghouse Life-Line "A" motors have cut our motor costs substantially ... helped us keep our chemicals moving down the line," says Mr. Fitch of Ohio-Apex. "Their built-in ruggedness, plus fool-proof sealing against corrosion, means longer life, lower maintenance."



West End "fills the order"...



Storage for 25,000 tons of industrial chemicals



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C-E Power Boilers for the Pulp and Paper Industry

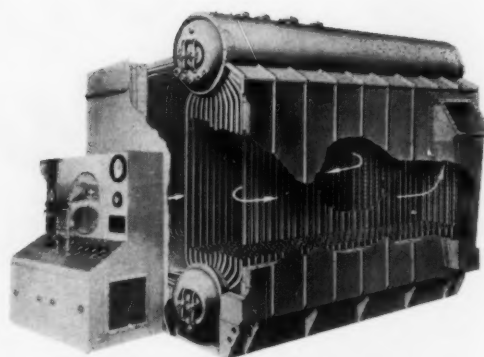
C-E offers boiler designs for any pressure, temperature and capacity . . . for any fuel or combination of fuels. The units illustrated here include both standard and custom designs with capacities from 4,000 to 750,000 lb of steam per hr, with pressures to 1350 psi and steam temperatures to 950F. Two units are for oil or gas firing. The other four are available for coal, oil, gas or bark firing—either singly or in any desired combination. In addition to those illustrated, there are other designs available for more specialized applications.

Whether you wish to add steam capacity to your present power plant — or build a single large boiler to meet all your steam needs — these units allow you a freedom of choice never before available. In addition to making full utilization of your bark supply, you can choose a supplemental purchased fuel best suited to the economics of your area for use when your bark supply is inadequate or your steam needs exceptional.

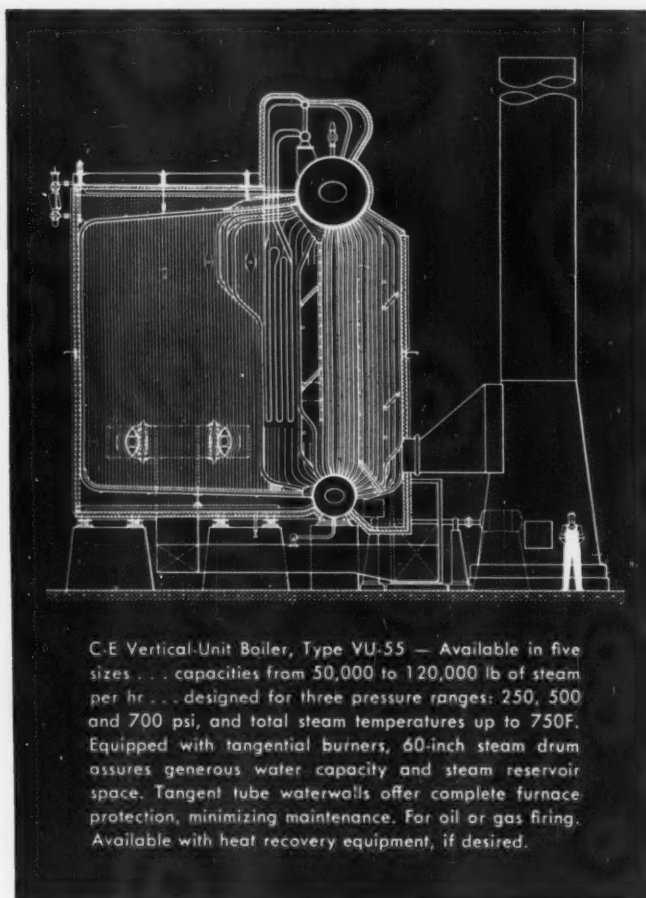
All these boilers have been proved in operation. They perform reliably and economically and — no matter what your combination of fuels or steam conditions — are designed to meet your needs exactly.

For further information, contact the C-E office nearest you. Or, if you prefer, write or phone the C-E Paper Mill Division in New York.

C-198

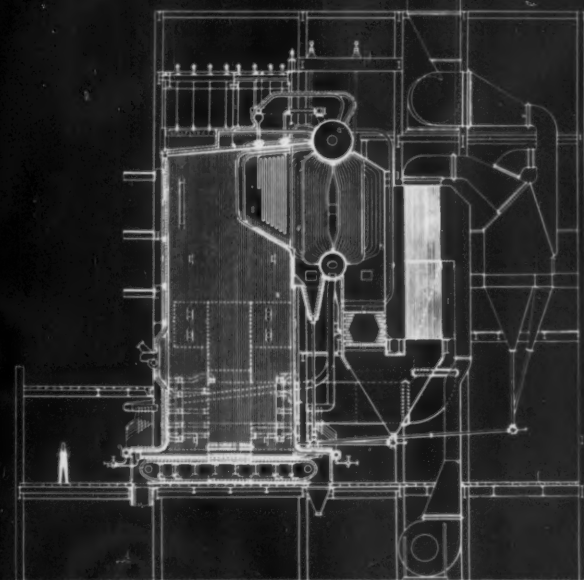


C-E Package Boiler, Type VP—Completely shop-assembled . . . available in 14 sizes from 4,000 to 50,000 lb of steam per hr capacity . . . pressures to 500 psi . . . available with integral console control panel. This unit contains more water-cooled area per cubic foot of furnace volume than any other boiler of its size and type. For oil or gas firing.

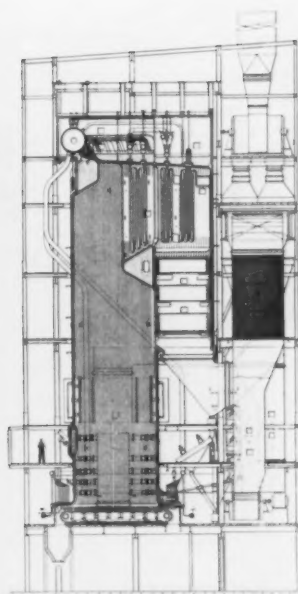


C-E Vertical-Unit Boiler, Type VU-55 — Available in five sizes . . . capacities from 50,000 to 120,000 lb of steam per hr . . . designed for three pressure ranges: 250, 500 and 700 psi, and total steam temperatures up to 750F. Equipped with tangential burners, 60-inch steam drum assures generous water capacity and steam reservoir space. Tangent tube waterwalls offer complete furnace protection, minimizing maintenance. For oil or gas firing. Available with heat recovery equipment, if desired.

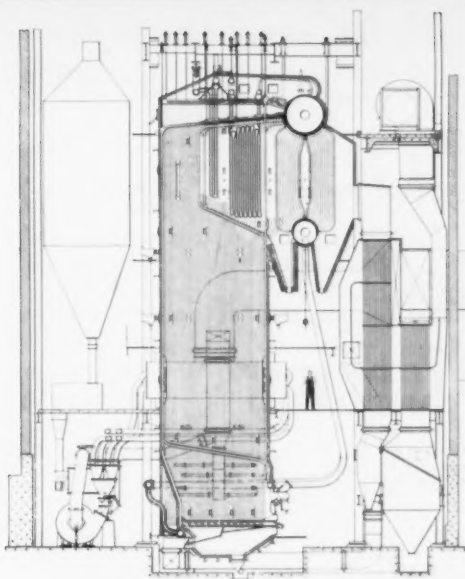
These drawings show but a few of the many types of C-E boilers available for pulp and paper mill use which burn two or more fuels. Not illustrated here is the C-E Chemical Recovery Unit.



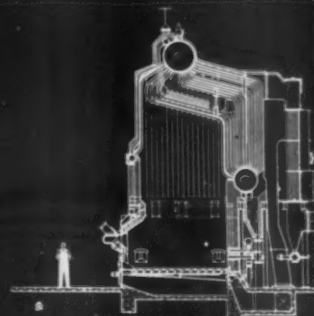
C-E Vertical-Unit Boiler, Type VU-40 — fired by C-E Tilting Tangential Burners and a C-E Continuous Discharge High Set Spreader Stoker. This unit is designed to burn natural gas, oil, coal and bark — a baffless boiler with capacities ranging to about 300,000 lb of steam per hr with pressures to 1350 psi; temperatures to 950F.



C-E Radiant Type Boiler — Type RX — for bark, oil, natural gas, stoker or pulverized coal firing in any combination. Available in capacities to 750,000 lb of steam per hr, with pressures to 1350 psi and temperatures to 950F. The unit pictured is fired with a C-E Continuous Discharge High Set Spreader Stoker and C-E Tilting Tangential Burners.



C-E Vertical-Unit Boiler, Type VU-40 — for capacities to about 300,000 lb of steam per hr, pressures to 1350 psi and temperatures to 950F. For pulverized coal and bark firing, singly or in any combination. The unit illustrated is equipped with C-E Bowl Mills, C-E Tilting Tangential Burners and a C-E Dump Grate Spreader Stoker.



C-E Vertical-Unit Boiler, Type VU-10—fired by a bark and coal burning C-E Spreader Stoker. VU-10 Boilers are available for capacities to 50,000 lb of steam an hr, with pressures to 500 psi and temperatures to 650F. This unit type is available for coal, oil, gas or bark firing — singly or in combination.

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PULP & PAPER — February 1959

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STADEX® Dextrin No. 135 • STAYCO® Starch • CALADEX® Starch No. 2 • STADEX® Dextrin No. 6 • STACOLLOID®
4555 Gum • ETHYLEX 2040 Gum • STALEY'S Pearl Starch • STAYBIND® No. 2 Starch
• STADEX® Dextrin No. 7 • ECLIPSE® A Starch • STALEY'S WP20 Adhesive • STADEX® Dextrin
No. 1170X • FIBRILOID A • ETHYLEX 2060 Gum • STADEX® Dextrin No. 10 • STAYCO® A-HW Starch • STAY-
BIND® Starch No. 5 • ECLIPSE® A Starch • STADEX® Dextrin No. 125 • STAZYME®
Starch • STACLIPSE® H Starch • STADEX® Dextrin No. 108 • CALADEX® Starch No. 1 • STALEY'S Powdered
Redried Starch A • STADEX® Dextrin No. 12 • STAYCO® G Starch • ETHYLEX 3095 Gum • ECLIPSE B Starch •
ETHYLEX 2070 Gum • STADEX® Dextrin No. 118 • STACOLLOID® • STALEY'S Powdered Redried Starch B
• STADEX® Dextrin No. 15 • STAYCO® G Starch • STAYBIND® Starch No. 77 • STADEX® Dextrin No. 126 • ECLIPSE®
C Starch • STAYCAL® Starch No. 1 • ETHYLEX 2075 Gum • STADEX® Dextrin No. 18 • STALEY'S Converting
Starch A • ECLIPSE® E Starch • SIMPLEX® Starch No. 2 • STADEX® Dextrin No. 25 • STALEY'S Bleached Powdered
Redried Starch A • ETHYLEX 2080 Gum • STAYBIND® Starch No. 5030 • STADEX® Dextrin No. 30 • STALEY'S
Calendar Starch • STADEX® Dextrin No. 11 • ECLIPSE® Starch • FIBRILOID B • STADEX® Dextrin No. 60 •
STAYCO® M Starch • STALEY'S Beater Starch No. 62 • ETHYLEX 2095 Gum • STADEX® Dextrin No. 60 N •
CALADEX® Starch No. 4 • STALEY'S Powdered Redried Starch C • STADEX® Dextrin No. 73
ECLIPSE® G Starch • STAYCO® Starch No. 2 • STALEY'S Laminating WP20 Adhesive • STADEX® Dextrin No. 73 • STALEY'S
Powdered Redried Starch D • ETHYLEX 3030 Gum • STACOLLOID® 4560 Gum • STADEX® Dextrin No. 78 •
FIBRILOID BX • STAYCO® Starch No. 50 • STALEY'S Powdered Redried Starch E • STADEX® Dextrin No. 80
• ECLIPSE® G2 Starch • STALEY'S 83 55 Starch • STAYCO® S Starch • STADEX® Dextrin No. 85 • STALEY'S Bleached
Powdered Redried Starch B • ECLIPSE® D Starch • STAYCAL® Starch No. 2 • STADEX® Dextrin No. 87 • STACLIPSE®
I Starch • STAYBIND® Starch No. 1 • STALEY'S 83 50 Starch • STADEX® Dextrin No. 105 • STALEY'S Bleached
Powdered Redried Starch • STAYCO® Starch No. 104 • STALEY'S Laminating WP20 Adhesive • STADEX® Dextrin No. 105 •
STACLIPSE® J Starch • STALEY'S Bag Adhesive Starch • STAYBIND® A Starch • STADEX® Dextrin No. 130 •
ETHYLEX 3060 Gum • STAYBIND® Starch No. 5 • STALEY'S 83 50 Starch • STACLIPSE® J-UB Starch • ETHYLEX
3060 Gum • STADEX® Dextrin No. 123 • STACLIPSE® KST Starch • ETHYLEX 3065 Gum • STADEX® Dextrin
No. 119 • STACLIPSE® 23 Starch • ETHYLEX 3075 Gum • STADEX® Dextrin No. 122 • STACLIPSE® 9018 •
ETHYLEX 3050 Gum • STADEX® Dextrin No. 3 • ETHYLEX 2020 Gum • STALEY'S WP20 Adhesive • ETHYLEX
2030 Gum • STADEX® Dextrin No. 135 • STAYCO® Starch • CALADEX® Starch No. 3 • STADEX® Dextrin No. 6
• STACOLLOID® 4555 Gum • ETHYLEX 2040 Gum • STADEX® Dextrin No. 120 • STALEY'S Pearl Starch •

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PAPER
MILL
EDITION



FEBRUARY 1959

Published quarterly for the information of paper and board mills

VOL. 1, NO. 1

Langston Winder Plays Role

HAMILTON PAPER HIKES QUALITY OUTPUT



Langston Slitter and Winder, left, On New Paper Machine. Winder On Number Seven Machine, right.

New Paper Machine's 70-Ton Capacity Included In \$4.5 Million Expansion

On the Schuylkill River at Miquon just beyond the city line northwest of Philadelphia stands Hamilton Paper Company, the inheritor of a proud tradition more than a hundred years old of papermaking at the site.

A noted producer of fine papers and the largest in the text paper field, Hamilton Paper three years ago drew up plans for a \$4.5 million major expansion of equipment and facilities.

Langston Winder Selected

At Samuel M. Langston Company, Camden, N.J., it was important news. A 122-inch Langston slitter and winder for a new paper machine was a part of the expansion program.

Completed last year and in operation early in December, the expansion includes:

—A new 126-inch fourdrinier machine equipped to produce with the most modern practices 70 to 80 tons daily of bond, offset and reproduction papers.

—A warehouse providing 60,000 additional square feet of finished paper storage area and new paper shipping facilities.

New Boiler

—Additional pulp handling capacity and new power and steam generating facilities, including a new 900 pounds per square inch, 875-degree boiler of 70,000 pounds per hour capacity.

—Additional stock preparation and storage facilities, including the new refiner capacity of two new jordans and two more hydrafiners.

—New cutter room facilities, including a new 100-inch trimmer, back feed and conveyors.

Hamilton's Third Langston

The new Langston slitter and winder is the third to be installed at Hamilton Paper.

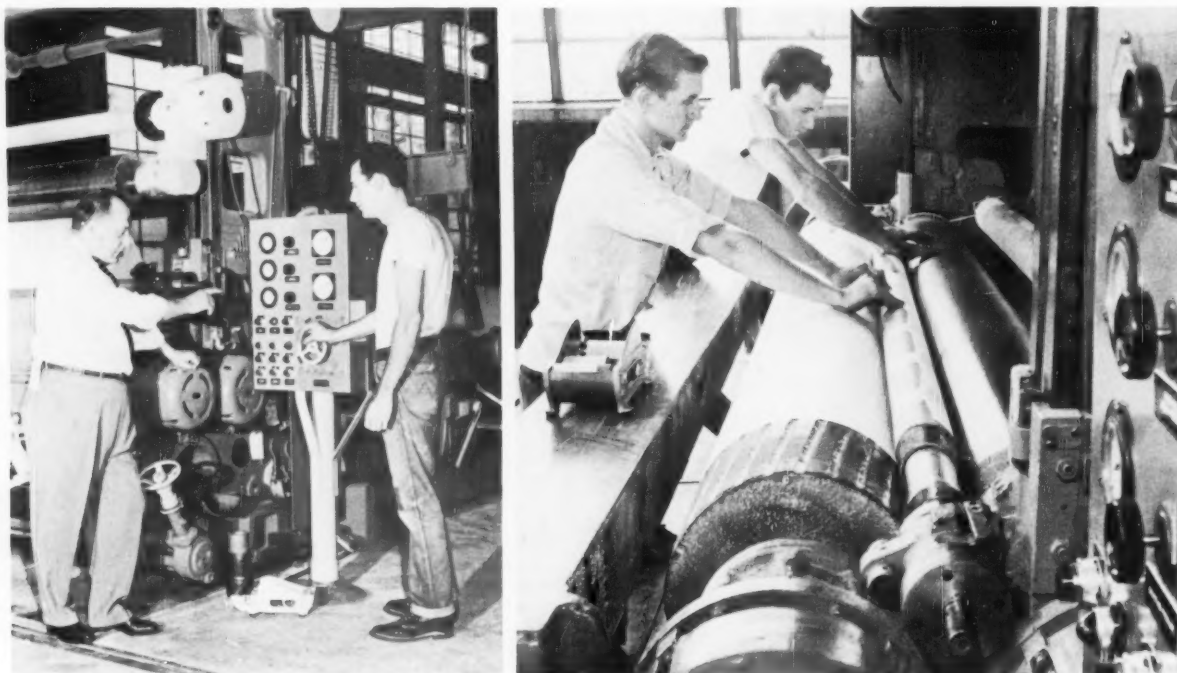
Of the decision to place a Langston winder on the new paper machine, John W. MacAllister, director of power maintenance and construction, says:

"Our Langston winders on the number two and number seven machines

(Continued on Next Page)



Number Two Machine Winder



PUSHBUTTON CONTROLS. John W. MacAllister, left, director of power maintenance and construction, discusses controls with operator of new Langston slitter and winder. Right, operator and assistant tape down paper to core for new run.

Langston Slitter And Winder Features Credited With 60 Percent Sales Rise

Langston built 60 per cent more slitters and winders and slitters and rewinders for paper and board mills in 1958 as against 1957, the Company announced.

The increase was attributed by Vice President—Sales E. B. Seeger to new labor-saving and quality raising features and to more service for the paper and board industry.

Seeger said the new features include shaftless unwind stand constant tensioning and on winders and rewinders, exceptionally dust free, shear cut slitters; more uniform roll density provided by a patented rider roll drive and loading arrangement; improved spreader devices, hydraulic roll drop and roll ejector; and all-around heavier, extra rugged construction.

The new Langston installations included machines for use behind paper and board machines and slitters and rewinders for finishing rooms and for convertors.

Involved were the second recent Langston paper machine winder for one mill and the third recent winder for another. One multiple installation included three slitters and winders for a paper mill.

Langston Winders Play Role At Hamilton Paper

(Continued from Page 1)

have been virtually maintenance free, operating on an average of 4200 hours per year. And we are very satisfied with the rolls they are producing.

Quick With Service

"Our men know the Langston machines. And when we need service, Langston has always been quick to respond. We agreed the new winder for our number eight machine had to be a Langston."

The new winder is a 122-inch wide,

type DA, driven by a variable speed DC motor with V-belt drives to the main drums and to the rider roll. It is built to slit and wind rolls of any diameters up to 60 inches at speeds up to 3000 feet per minute.

Automatic Air Brake

An automatic air brake quickly stops operation when a predetermined diameter is reached. The brake also operates to maintain more accurate tension control on the paper.

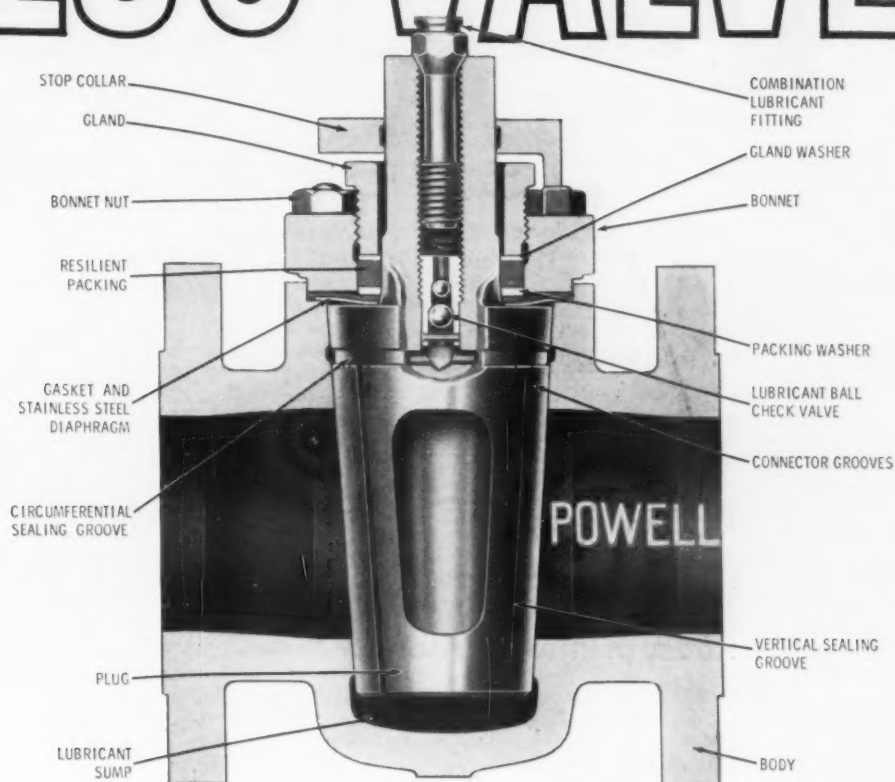
A pushbutton control panel enables the operator to regulate the functions of the winder from one spot.

Output to Rise 30 Percent

Slitting and winding a wide variety of high quality papers, the new Langston winder is performing its important role with the whole new cast of Hamilton Paper equipment and facilities in boosting output.

Even with planned retirement of two of the present eight paper machines, Hamilton Paper will have the capacity to increase its production by more than 30 percent. The new Langston winder will play its part in providing this additional capacity.

POWELL LUBRICATED PLUG VALVES



Sectional view Powell Screwed Gland Lubricated Plug Valve.

Like all Powell Valves, Powell Lubricated Plug Valves are superior in their field . . . and have many advantages over other conventional types of Valves.

- Simple design: only three basic parts—Body, Bonnet, Plug.
- Quick, complete shut-off—a quarter turn will close or open the valve.
- Tapered Plug assures positive seating.
- Machined surfaces of plug and body are not exposed in the open position. Any media adhering to the plug when in the closed position is removed when plug is rotated.

- Cavity-free straight passage assures streamlined flow in either direction. Scale and sediment cannot collect.

Powell Lubricated Plug Valves are available in sizes $\frac{1}{2}$ " through 16", depending on the type required—Semi-steel 175 and 200 pounds WOG;—Carbon Steel ASA 150 and 300 pounds.

Powell can also furnish Lubricated Plug Valves in other alloys on special order.

For all your valve needs, make it a policy to consult your local Powell Distributor—or write directly to us.

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What's Ahead for Paper

Paper and paperboard will set new record in 1959, but industry still faces the danger of overcapacity

By **MORRIS C. DOBROW**
Exec. Secy., Writing Paper
Mfrs. Assn.

(Excerpts from report to U.S. Pulp
Producers Assn.)

• My theme is the present position of the paper industry and where it is going. As a springboard for developing the situation and prospects in our own industry, I must make a few remarks about the general situation in the United States.

The high level of contract awards indicates sustained residential and non-residential construction. The automobile industry is again hitting a high stride in production, following the slowdown by local strikes during October and early November.

The results of the election, the magnitude of the changes in the security markets and the frequency with which inflation is being predicted in business and financial circles, are a warning that an increasing part of the American public is becoming inflation-minded.

Here lies our greatest danger.

The Federal Reserve Board is trying its best to counteract the inflationary psychology, but it can hardly do the job alone. Its power is practically limited to interest rates and limitations of the supply of money and credit. Further increases in Federal Reserve rates undoubtedly would slow down the recovery.

The attitude of the president and the administration in the matter of inflation is well known. What position the new Congress will take—what legislation will develop—only time will tell.

For the moment, it is fairly clear that recovery will proceed at a pretty good pace in the early months of 1959 and well into the second quarter.

Looks for a 5% Increase

1959 will be a better year than 1958. I believe that we can look for a

gain of about 5%—a trifle more or a trifle less.

Of course, if the inflationary psychosis should really catch on fire and we got galloping inflation—a real flight from the dollar into commodities—there is no telling how wild a boom we could get. But I don't believe that is going to happen in '59.

Paper Industry Near Record

The final figure for the production of paper and paperboard in the U.S. in 1958 will be just about the same as it was in 1957. The paper grades will be down 1%; paperboard will be up 1%. Paperboard production in the 4th quarter will be pretty close to the record quarter which it established in the 2nd quarter of 1956. Paper grades are still quite away from the 1956 record.

On the basis of average capacity, the paper industry will have operated at 91% of a 6-day capacity; the paperboard industry at 84% of capacity; and the industry as a whole at 87% of capacity.

This is a far cry from full operations, with some mills on a 6-day basis and many mills on a 7-day basis. But it is, nevertheless, a much better operating rate than was enjoyed by the other major industries in the country.

Production Should Rise—Capacity is Higher

We confidently expect that paper and board production in 1959 will exceed the production of 1958, the previous record year. Overall industry production in 1959 should be somewhere between 32 and 32.5 million tons, or about 88% of the average 6-day capacity.

Three years ago, as we approached the end of 1955, the industry was producing 30 million tons and we had a capacity of slightly under 31 million tons (on a 6-day basis). This was a reasonably comfortable situation.

Then I was not sure that per capita

Editor's Note: Mr. Morris Dobrow has spent his entire career in studying the intricacies of the paper industry. Today, he is regarded as one of the more astute observers of the industry's economics. In this report he presents an interesting analysis of the industry's state of health and the outlook for the years ahead.



MORRIS C. DOBROW

consumption would grow as fast as it had in the last 20 years. I was sure that the population would continue to grow and that demands for paper and paperboard would increase at least as much as would population—perhaps a little more.

I also believed that the new machines and extensions already projected at that time for the two succeeding years, 1956-57, would almost take care of the expected requirements in 1960. If, however, per capita consumption should rise to something like 425 lbs. or over, perhaps an additional 2 million tons of capacity would be required by 1960.

As you can see from the table which leads this article, not only were the 4 million tons (previously committed) installed in 1956 and 1957, but an additional 2 million tons have been installed, or are in the process of completion. As we face 1959, we have a capacity of about 37,500,000 tons (on a 6-day basis) against an expected production of 32-32.5 million tons.

U. S. PAPER AND PAPERBOARD INDUSTRY

DOMESTIC PRODUCTION REQUIREMENTS FOR

| YEAR | | | | | POPULATION IN THOUSANDS | APPARENT PER CAPITA CONSUMPTION IN LBS. | DOMESTIC PRODUCTION REQUIREMENTS FOR | | | INDUSTRY CAPACITY 310-DAY BASIS |
|-----------|------------------------|-----------|---------|-----------------|-------------------------------|--|--------------------------------------|------------------------|------------------------|---------------------------------------|
| | DOMESTIC PRODUCTION | IMPORTS | EXPORTS | TOTAL SUPPLY | | | 425 LBS. PER CAPITA | 450 LBS. PER CAPITA | 500 LBS. PER CAPITA | |
| 1925 | 9,001,742 | 1,567,121 | 152,351 | 10,416,512 | 115,800 | 180 | -- | -- | -- | 11,623,450 |
| 1939 | 13,509,642 | 2,687,494 | 248,569 | 15,948,567 | 130,900 | 244 | -- | -- | -- | 16,557,410 |
| 1946 | 19,227,667 | 3,625,982 | 393,250 | 22,510,399 | 141,200 | 319 | -- | -- | -- | 20,420,000 |
| 1950 | 24,375,083 | 5,008,222 | 371,546 | 29,011,759 | 151,700 | 382 | -- | -- | -- | 26,059,000 |
| 1955 | 30,178,102 | 5,386,174 | 845,233 | 34,719,043 | 165,300 | 420 | -- | -- | -- | 30,926,000 |
| 1956 | 31,441,192 | 5,836,030 | 786,209 | 36,491,013 | 168,200 | 434 | -- | -- | -- | 32,579,000 |
| 1957 | 30,677,548 | 5,466,427 | 869,713 | 35,274,262 | 171,200 | 412 | -- | -- | -- | 34,513,000 |
| Est. 1958 | 30,700,000 | 5,000,000 | 800,000 | 34,900,000 | 174,100 | 401 | -- | -- | -- | 36,184,000 * |
| 1959 | -- | -- | -- | -- | 177,100 | -- | 33,400,000 | 35,600,000 | -- | 36,830,000 * |
| 1960 | -- | -- | -- | -- | 180,100 | -- | 34,100,000 | 36,300,000 | -- | 37,200,000 * |
| 1965 | | | | | 195,700 | -- | 37,400,000 | 39,800,000 | 44,700,000 | -- |
| 1970 | | | | | 208 to 214,000 | -- | 40,600,000 | 43,300,000 | 48,600,000 | -- |
| 1975 | | | | | 225 to 235,000 | -- | 44,700,000 | 47,600,000 | 53,300,000 | -- |
| 1980 | | | | | 245 to 260,000 | -- | 49,500,000 | 52,600,000 | 58,900,000 | -- |

POTENTIAL
PRODUCTION
REQUIREMENTS

* NOTE: Since this was prepared the American Paper and Pulp Association's latest census of Capacity indicated approximately 500,000 additional tons for 1958-59-60. Writing Paper Manufacturers Association

TREMENDOUS POTENTIALS FOR PULP, PAPER AND PAPERBOARD, hinging upon growth in the United States population and increased per capita paper and paperboard consumption are estimated in this table.

I need not remind you that it is the desire and intention of many of the operators of these machines to run seven days a week—not six. The situation was aggravated by the recent recession which gave us a decline in consumption requirements, rather than a normal gain. With the recovery well under way, it is believed that the industry will resume its normal trend of growth—about 3% per year.

Population Will Be Important

The tremendous increase in our population since 1950 is one of the most dynamic factors in our economy. And there is no doubt about the continued growth in our population.

On July 1, 1940, the total population in the U.S. was 132 million; by July 1, 1950, ten years later, it had jumped to 152 million and, at the present time, the population is 175 million. By 1960, it is estimated that our population will be over 180 million. We are adding about 3 million people every year.

In connection with the recent increase in population, it is well to remember that many of the new members of our society are very young. However, the first war babies, born in 1940, are just beginning to reach the early ages of economic maturity and there will be a wave of them coming along each year from now on. They

will have a powerful effect on increasing consumption of all types of goods in the 1960 decade.

Looking Ahead

The result of increased spending authorizations and a decline in tax revenues is setting up a record peacetime deficit. It may run as high as \$12 billion, while business is recovering briskly and when the Federal Reserve Board believes anti-inflationary policies, rather than anti-recessionary pressures, are needed. Thus, the deficit, instead of combating the recession, is aiding and abetting inflation. This is the dilemma that will be facing the administration and Congress early in 1959.

Let's see what they are going to do about it.

As far as the paper industry is concerned, the moderate liquidation of paper inventories of 1958, the continued rise in consumer expenditures, the termination of inventory liquidation generally, the continued gain in population—all indicate a reasonable expectation of rising consumption and a reasonable assurance that paper and paperboard production in 1959 will recover from the minor slumps of the last two years and make a new high in 1959. Nevertheless, the industry will still be faced with the problem of over-capacity in 1959 and in 1960.

New Type Recovery Units Introduced By Two Firms In Far West

Weyerhaeuser Timber Co. Pulp Div. has installed a new spray type scrubber which, in conjunction with an existing electrostatic precipitator, eliminates dust from stack gases discharged at the firm's Everett, Wash., kraft mill. The scrubber, developed and built by WTCO., has 400 spray nozzles through which water circulates at the rate of 3,000,000 gpd. According to R. E. Baker, mgr. of mfg. for pulp div., this addition removes over 90% of the ½% of suspended ash missed by the precipitator.

Longview Fibre Co., at Longview, is installing a York Demister on a dissolving tank of its No. 15 recovery furnace. The objective, says R. P. Wollenberg, vice pres.-operations and mill mgr., is to recover wet and dry particles of green liquor escaping through the dissolving tank vent.

This installation, scheduled for completion in March or April, has the dual objective of preventing dissipation of corrosive particles in the plant area and returning captured chemicals to the production system. If this experimental application proves successful, similar units will be put in service on the rest of the mill's dissolving tanks.

Preview of Paper Week 1959

No "Hearts and Flowers", but much talk about the "Great Day" that's coming as the industry girds for 1960

● The year just dawned is still very much an unknown quantity, but already it has been hailed by economists as the threshold of the Golden Sixties. It will be in this atmosphere of better things to come that the pulpwood, pulp, paper and paperboard industry will hold its series of annual meetings in New York City February 23 to 26.

It wasn't too long ago (Paper Week 1958) that one wag reported the industry was sitting up with a sick friend; one even likened Paper Week 1958 to a requiem for a heavyweight. But this year it will be different. The industry has even been termed "recession-proof" by one publication.

The industry has come through, on the whole, with flying colors. There were rough spots to be sure, and they will continue to be with the industry for some time. "But," explains one pulp salesman, "this recession-over-expansion period has taught us many things. Those of us who knew how to sell got out and sold. The others soon learned too—or got out."

Industry Looks Overseas

This threshold year of 1959 can be likened to a countdown. Call it a cellulose countdown, if you wish. But it will be a year of preparation for what is expected to be a resurging dynamic economy—not only in the United States, but, perhaps more important, in the overseas areas.

There are some "ifs" in the industry's expansion gamble. Population is one; increased demand for its product another. In 1958 the world increased its population by some 47 million people. Red China had a lion's share with a 15 million increase; India was second with 6 million, Soviet Russia third with 3.6 million and the U.S. fourth with 2.6 million. In 1958 the U.S. population went over the 175 million mark. The world is expected to add another 50 million to its population in 1959.

Another reason for the industry's optimism is international prospects. The "Forward Look" is now the "Overseas Look." This is not confined to North America but is shared by other nations. Described by some as good signs are the Common Market, which went into effect January 1st, 1959, and the recent (December



JAMES R. LIENTZ
1959-1960 TAPPI President

1958) common money convertibility and proposed Free Trade Area.

The promise of a tremendous packaging boom in Europe hinging upon supermarkets mushrooming across the face of Europe is one lure for the papermakers of the world.

32 Million Tons Predicted

Paper and paperboard production in 1958 was an estimated 30.8 million tons as the industry operated on the whole at 87% capacity on a 6-day basis (paper at 91%; paperboard at 84%). Production for 1959 is predicted at upwards of 32 million tons.

As the industry leaders meet this month wiser heads will caution, as they did in the midst of the last expansion race, that the expansion horns should not be donned so soon again or so prominently. This is the one great danger, some say, that the industry may again overjudge its customers' capacity to consume.

APPA-TAPPI Sponsor Joint Session

In departure from the tradition of its Open Industry Meeting held at the Waldorf-Astoria in the closing hours of Paper Week, the APPA will join with TAPPI for a general industry meeting on research.

Lt. Gen. James M. Gavin, vice president of Arthur D. Little Inc., will keynote the session with a talk on research in the space age. A. B. Layton, president of Crown Zellerbach Corp., will discuss what management expects from research and the researcher. John G. Strange, president of the Institute of Paper Chemistry, will moderate the meeting. David L. Luke, president of West Virginia Pulp &

Paper Co., and K. O. Elderkin, president of Bowaters Research & Development Inc., will be panelists. Dr. Howard S. Turner, vice pres. of research, Jones & Laughlin Steel Co., will explain what research expects from company management.

Because of the North American industry's increased interest in the export picture, the APPA's Export Committee will have a panel of speakers—including an exporter, an economist and a banker—on the theme, the Paper Man Takes a Look at the Common Market. Eric Lagerloef, sec. of the committee, will release his special report on the United States' pulp and paper exporter's stake in the Common Market and the proposed Free Trade Area.

Fewer Conflicts in TAPPI Papers

The perennial problem for TAPPI members of too many concurrent sessions will be solved to some extent this year. TAPPI has scheduled fewer sessions and fewer papers to alleviate this frustration.

Ward Harrison, retiring TAPPI president, is slated to turn his gavel in this year. James R. Lientz, vice pres. of Union Bag-Camp Paper Corp., has been nominated for president; and Harold M. Annis newly-elected vice pres. of research and development at Oxford Paper Co., has been nominated for TAPPI vice president, and this is tantamount to election.

Cold Caustic Pulping Feature

The alkaline pulping session will get some operating data from Keith V. Thomas, technical director of Sprout, Waldron & Co. Inc., on new installations using cold caustic pulping, especially in Italy and Australia.

A much-discussed subject, the finishing room, will get some attention. Last year Charles R. Stevens, president of Charles R. Stevens Inc., called the finishing room the orphan of the paper industry. This year, Mr. Stevens will adopt the orphan in a talk to be given during the general session.

The Corrugated Containers Sessions will feature quality control. There will be a joint TAPPI-ASTM-ACS symposium on chemical methods for testing cellulose.

The development trends and out-

look for market pulp will be explored by Reed R. Porter, exec. secy. of the Assn. of Pulp Consumers Inc. He has also lined up an interesting luncheon speaker, Maj. Gen. Donald N. Yates, commander of the Air Force Missile Test Center, Air Research and Development Command, Patrick Air Force Base, Fla., who will show the progress of the United States missiles program through slides.

APPA's Materials Committee will study transportation, price trends for various lines of pulp and papermaking equipment and the international flow of commodities.

The APPA Community Relations Committee has been superseded by a Public Relations Committee, which will include the community relations program but will operate on a broader scope. Bill Chisholm, president, Oxford Paper Co., is chairman of the

new committee. During Paper Week the new group will be in the midst of developing an industry public relations program.

Elderkin to be Gold Medalist

Karl O. Elderkin, president of Bowaters Research & Development Inc. at Calhoun, Tenn., will be the recipient of the 27th TAPPI Gold Medal. The presentation will be made at the annual luncheon at the Commodore Hotel Feb. 26 by G. W. E. Nicholson, president of Tennessee Paper Mills Inc.

A native of Nova Scotia, Mr. Elderkin is a graduate engineer of McGill University. Following a brief association with the steel industry, he entered the pulp and paper field and was with such firms as St. Lawrence Corp. Ltd., Price Bros. & Co. Ltd., Abitibi Power & Paper Co. Ltd. and



KARL O. ELDERKIN
27th TAPPI Medalist

Canadian International Paper Co. From 1939 to 1952 he was mgr. for Crossett Paper Mills; in the latter year he became vice pres. and gen. mgr. of Bowaters Southern Paper Corp.

Mr. Elderkin was TAPPI president in 1955 and 1956.

Establishes Woodpulp Marketing Dept.



LEWIS K. JOHNSTONE

The Champion Paper and Fibre Co., Hamilton, Ohio, U.S.A., announces plans to establish a new woodpulp marketing department with Lewis K. Johnstone, formerly director of purchases, as director of the new unit.

Reuben B. Robertson, Jr., Champion president, says the pulp marketing department is part of the firm's continuing program of developing Champion participation in worldwide pulp and paper trade. Champion produces market woodpulp in its U.S. mills and soon will market the pulp produced at a new mill it is building and will manage in Brazil.

Mr. Robertson said that the new department's objectives will be to enable the company to capitalize on its opportunities as a major producer, user and distributor of pulp in both foreign and domestic areas.

Responsibility for the marketing of pulp and related products will be transferred from the paper sales division and the general purchasing department to the pulp marketing department. A pulp policy committee

will establish basic policies covering purchase, sale and investment in pulp.

Mr. Johnstone, a native of Chicago, and holder of both a bachelor of arts degree from Dartmouth College and an advanced degree from Dartmouth's Amos Tuck School of Business Administration, joined Champion's general purchasing department in 1955. He was named assistant director of purchases in 1956 and director of purchases in 1957. During World War II he served as an officer in the U.S. Navy.

From 1946 to 1949 he was with the circulation and advertising sales

department of the Cincinnati *Enquirer* and then until 1955 owned the distributorship for a materials handling firm. He and his wife and three children live at 3314 Avery Lane, Cincinnati, Ohio.

Gottesman Loan Fund Established at Institute

A gift of \$25,000 to The Institute of Paper Chemistry from the D. S. and R. H. Gottesman Foundation for establishment of the D. Samuel Gottesman Loan Fund to aid students, needing financial assistance, is announced by John G. Strange, president of the Institute, and Ira D. Wallach, president of the Foundation.

25th Year for Unique Industry Group

The 25th anniversary of the Wisconsin Paper Group, a unique traffic pooling organization, was set for Jan. 31, at North Shore Golf Club, near Appleton, Wis., in a special program organized to follow the annual luncheon meeting. The occasion also marks the 25th consecutive year of service by Leo Schubart, Neenah Paper Co., as treasurer of the Group.

Organized in 1934, with a membership of 19 Wisconsin paper manufacturers and converters, the Group now serves 35 Wisconsin firms which regularly take advantage of its car pooling and shipping service for faster and more frequent delivery of Wisconsin-made papers to all markets of the United States.

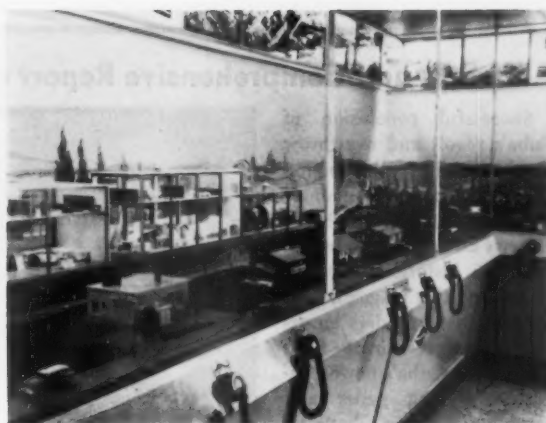
The Group's slogan, "cooperating to give better service," is carried out

through regularly scheduled daily movement of freight cars to all principal population areas.

Members of the executive committee are: John H. Wilterding, (George Banta Co.) chairman; Thomas Leech, (Whiting-Plower Paper Co.) vice president; Leo O. Schubart, (Neenah Paper Co.) secretary; Carl A. Schiebler (Nekoosa-Edwards Paper Co.); G. E. McCorison (Thilmany Pulp & Paper Co.); Douglas G. Hyde, (Marathon); R. W. Mahony, (Appleton Coated Paper Co.); W. L. Thornton, Jr., (Kimberly-Clark); Arthur R. Hedlund, (Bergstrom Paper Co.); and Vinson Krapfel, (Consolidated Water Power & Paper Co.). Irwin Pearson, has been executive secretary of the Group at Menasha, Wis., since 1934 and is in charge of operations.



OUTSIDE VIEW OF PAPERMOBILE, showing group of visitors entering.



INSIDE VIEW—note ear-phones alongside counter which give running story of pulp and paper making.

Thousands Learn About Paper

by visiting Wisconsin Industry's Papermobile. It will be routed to schools, including those in big cities . . .

● Touring Wisconsin cities and towns, visiting schools and gathering places for grown-ups, is "Paper City, Wisconsin, U.S.A.," a mobile 160 sq. ft. detailed exhibit of a pulp and paper mill, woodyard and forest, as well as homes of workers.

There has never been anything like this newest "invention" of the alert and hard-working Information Service, Wisconsin Paper Industry, which maintains permanent offices in Neenah, Wis., and its 17 sponsoring mills. ISWPI has pioneered many successful techniques now used by the entire U.S. industry for improvement of community relations, but this undoubtedly tops them all.

This Papermobile, as it is named in big letters on the side of the big red and white trailer (pulled by its own red and white truck) will spend many months in Milwaukee alone, visiting schools, etc. Over 80,000 persons walked through it at Wisconsin's State Fair last summer.

A 7 kw electric plant supplies power for lights, model animation, picture panels and electric baseboard heating units. In school use, beginning early in 1959, the Papermobile will drive directly to the school building and, with the push of a button, start telling its story.

The story is actually "told" through six repeating tape recorders playing through 18 sets of earphones—three to each operation. An eight-page "guide book," operations keyed by number

to the various machines, is also part of the story-telling device. A teacher's guide will give each instructor an outline in hand to work into his curriculum months in advance of the Papermobile's visit.

Appearances in mill towns serve two purposes: 1) familiarizing employees with the project and 2) "previews" for local school administrators, city officials and newspaper people. During the latter, mill officials act as hosts. The tour of sponsoring mills was aimed to shake out "bugs" in the operation, before school appearances in many cities. Numerous requests have been received asking for use of the exhibit and the Information Service, Wisconsin Paper Industry executive committee has had the difficult job of keeping the presentation on target and within the management of the sponsoring mills.

Replacement cost is estimated at about \$20,000 but, according to an Information Service spokesman, "we saved a third of that through the splendid cooperation and assistance of many of the sponsoring mills." The animated models and layout were constructed by Bay Industrials of Green Bay. Design supervision and management of the project was the assignment of ISWPI. As examples of mill cooperation: Ear-phones were taped by Kimberly-Clark, counter fronts of Consoweld were built and donated by Consolidated Water Power & Paper, unique generator

housing was created by Thilmany Pulp & Paper, much of electrical wiring was by Bergstrom Paper electricians, etc.

For any further information on this Wisconsin community relations project, contact John T. McCune, coordinator, Wisconsin Paper Industry Information Service, 104 North Commercial St., Neenah, Wis.

Big Gain in Sulfite Waste Use for Roads

Final figures show 61.9 million gals. of spent sulfite liquor were distributed as roadbinder by Wisconsin pulp mills during the 1957 roadwork season, Lake States Roadbinder Assn. reports. This compares with 53.9 million gals. in 1956.

Polyethylene-Coated Corrugated Board Developed

A new type of corrugated board—incorporating a moisture and grease proof polyethylene coating—has been developed by Mead Board Sales and Mead Containers, Inc., subsidiaries of The Mead Corp. Coated with U.S. Industrial Chemicals Co.'s Petrothene® resin, the new board is expected to find wide acceptance for packing meat, confectionery goods, dairy products, furniture, glassware, and other commodities.

A Timely and Comprehensive Report on Cuba's Progress

Successful conclusion of Cuba's revolt and overthrow of the Batista dictatorship has thrust that little country into the bright spotlight of of news all around the world.

At this historic moment in its history, this magazine has brought to its readers an exclusive report direct from Havana on Cuba's newest industry—making paper and paperboard from bagasse.

Obtained under considerable difficulty, as the Cuban revolution approached its dramatic climax, this is unquestionably the most comprehensive report of this kind ever prepared on the phenomenal progress which Cuba has made in this field.

The author, John D. Harbron, knows his Cuba well. He is one of a very small number of non-Cubans who have studied at the University of Havana. He went to the Cuban university in 1947 to work on his master of arts



John D. Harbron

degree. He has written articles for Spanish language publications and also has had extensive experience in writing about paper and paperboard. He returned to Cuba, as Batista's grip on the country was finally being loosened, and agreed to make this report especially for this magazine.

Mr. Harbron is manager of the Canadian News Bureau, Business Week magazine of New York. He was previously editor of Canadian Packaging, Canada's largest industrial publication in the packaging materials field. He has also contributed marketing and semi-technical articles in the field of paper and paperboard technology to several American and British paper magazines.

His Spanish-language reporting has included items in Latin-American publications and the former El Mundo Azucarero of New York. In 1955, Mr. Harbron won honorable mention in a Canada-wide business paper editorial contest, The Kenneth R. Wilson Memorial Award, for a campaign which brought to light new methods for testing and preserving paperboard containers in transit.

One of his present major reporting tasks is regular coverage and analysis of both the Canadian newsprint and pulp and paper industries for Business Week.

Cuba's Bagasse Success

1. "Without sugar—no nation"
2. \$28,000,000 investment
3. Background—long research
4. Seeks newsprint markets
5. Hardboard, particle board
6. Paperboard self-sufficiency?
7. Fine papers, other products
8. Producers outside Cuba
9. Cuban development reaches maturity

BY JOHN D. HARBRON

—Havana, Cuba
• After 25 years of skepticism from competitors and slow, trial-and-error methods in research and production, it is ironic that Cuba's bagasse by-products industry has finally come of age in the midst of the most protracted upheaval this island republic has yet seen.

Even before the thrill-packed victory of Fidel Castro and his bearded followers, and while guerilla war, raids and bombings were daily events, the first positive breakthroughs in the commercial sales and end use of Cuba's vast bagasse resources had come about.

Right now, these include bagasse newsprint, hardboard, particle board,

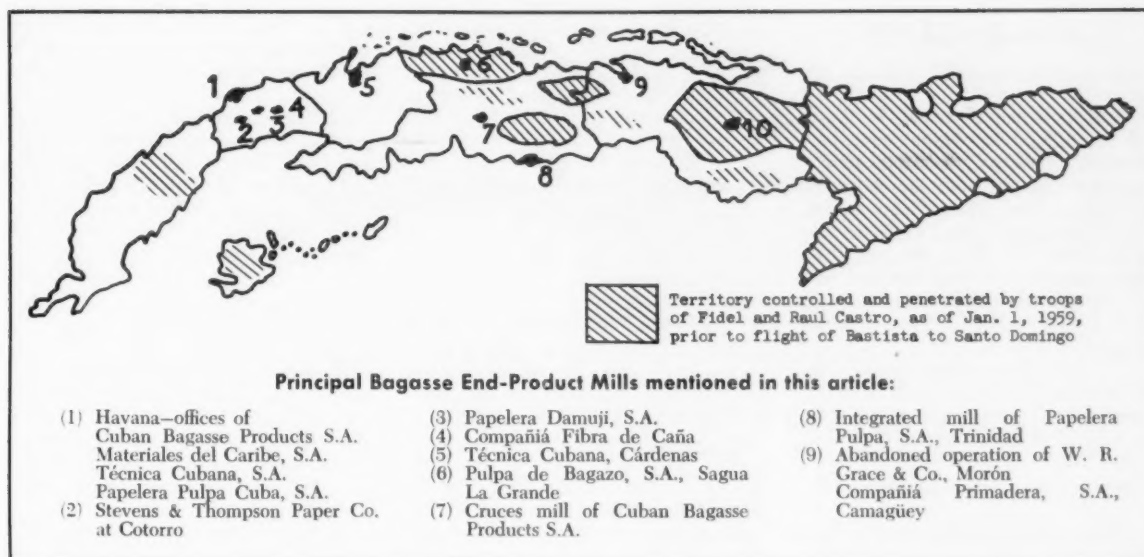
acoustical tiles, some bagasse pulp fine papers and even office furniture. In the next six months, these will be joined by bagasse paperboard, to be turned out from a large integrated sugar-making to paperboard-fabricating operation in central Cuba, which suffered severely from interference during the revolution.

1. "Without Sugar, There is No Nation"

In an increasingly diversifying economy, which Cuba's now is, and in a nation with Latin America's highest per capita middle class, sugar is still the staple export. "Sin azúcar, no hay país," goes a Cuban saying

("Without sugar, there is no nation"). To give added body to this truism, is the prospect that from Cuba's sugar mills which annually reject about 5 million tons of the fiber and pith residue called bagasse from squeezing sugar liquor out of sugar cane, will come a major, new export industry in the Caribbean.

Because of Cuba's zooming postwar prosperity, including the combination of industrial growth with the fact that Cuban sugar cane is cut during most of the year, (unlike other sugar-producing countries), bagasse by-products are developing faster here than in other, more publicized Latin American nations where small mills have long used bagasse pulp as a base for fine paper



and some board manufacture. These have also included the Philippines, where today 90% of the paper currency of the Philippine Republic is printed on bagasse paper; Taiwan (Formosa), one of whose top bagasse chemists is now on loan to a Cuban mill; South Africa, Peru and the U.S.A., chiefly Louisiana, where the Louisiana State University has long been a center of bagasse research.

2. \$28,000,000 Invested in Cuban Bagasse Mills

Into Cuba's bagasse mills have gone \$28 million in Cuban and American capital. (For breakdown see footnote to chart). Largest benefactor is the Papelera Pulpa Cuba S.A. mill at Trinidad in Las Villas Province which has received about \$12.9 million, a large proportion of it from the Banco Nacional de Cuba, the country's central bank. The Técnica Cubana S.A. newsprint mill at Cárdenas, 125 miles east of Havana (see map), has received \$10 millions from Cuban sources. As the only bagasse newsprint mill in commercial production in Latin America, its local capital sources are of interest.

These are made up of \$5 million from BANDES, a typical Latin American developmental loan bank with semi-government affiliations. BANDES (Banco de Desarrollo Económico y Social) is one of six Cuban banks of this type. The second main source of local capital for local Cuban enterprises, originates in the Cuban trade unions, in this case, the sugar workers' unions.

Under General Batista's presidency, the Cuban Federation of Labor and most of its unions were captive to the Cuban strongman. Where their money

came from was anyone's guess. Since 1953, some of it certainly originated with the \$15 million paid out in bonuses to sugar unions and workers alike by the Batista regime. The powerful confectioners' union, for example, loaned \$7 million to help build Conrad Hilton's huge, luxury hotel in Havana. It is too early to predict what changes there may be, if any, under the new government.

3. A Background of Long Scientific Research

Tied in with this, is the perhaps obvious fact that all of these bagasse operations are growing from already, well-established sugar plantations and centrales (the Cuban word for sugar mills). Técnica Cubana is developing from the de la Roza Central Progreso near Cárdenas. The Papelera Pulpa Cuba S.A. establishment is an outgrowth of the Central Trinidad of the Azqueta family, a 3,000 ton per day raw sugar mill, whose owners also operate three sugar mills in Cuba and one in Venezuela. Another is Papelera-Damuji, built by one of the mills owned by Rancho Veloz and held by the de la Riva family. The Pulpa de Bagazo S.A. \$3 million mill, at Sagua la Grande, is an outgrowth of Central Resulta, owned by the Pujol family.

As such, they have a wealth of technical and operating experience with sugar and bagasse to apply to this new, related process of the sugar industry. They have long been interested in cellulose sciences and processing. The present coming-of-age of bagasse has also given wider contracts and new scope to American designers and builders of newsprint and paperboard-fabricating machinery which utilize local fibers of many kinds overseas.

Paramount among these in Cuba are the Parsons & Whittemore-Lyddon Inc. of New York and its affiliate, the Black-Clawson Co., and Rice Barton Corp. of Worcester, Mass. Dr. Joseph E. Atchison, vice president of Parsons & Whittemore, is one of a handful of American experts on bagasse utilization. And though presently very active in the Papelera Pulpa Cuba S.A. operation, which, with the Técnica Cubana newsprint mill, aims to make Cuba self-sufficient in paper products, he has published numerous papers on bagasse research methods in technical publications of such bagasse-producing nations as India and the Philippine Republic.

4. Newsprint Industry Seeks Markets Outside Cuba

So far, only one mill, Técnica Cubana S.A. is in business making newsprint, though the Papelera-Damuji S.A., about which little is known, may produce some in 1959. Técnica Cubana's product first appeared in a trial run of 500 copies of a Havana daily last June 29. On Sept. 9 and 16 respectively, *El Crisol* and *El País*, two other Havana dailies successfully ran their editions for the day on Técnica Cubana's bagasse newsprint. *El País*, in a front page box, announcing the type of material on which it was printed, caught the Cubans by surprise. "For the first time in the history of journalism, a daily paper [has] published a complete edition made from 100% cane bagasse," it proudly stated.

On Oct. 8, a major conference of all Cuba's leading executives in the bagasse field, held here in Havana, resulted in some interesting figures from Sr. Cristóbal Díaz, president of

CUBA-BAGASSE

Técnica Cubana. The mill, he said, will do 30,000 to 40,000 tons per annum, thus meet Cuba's total newsprint demand. Its ultimate capacity will be 2 million tons per annum, far in excess even of Cuba's needs in the distant future. Sr. Díaz intimated that "spot markets," resulting from uncontrollable shortages of imported newsprint, would soon be past history. Though an obvious reference to wartime scarcity of Canadian newsprint sold in the island for as much as \$400 a ton, he may have intimated that a small, re-sale market exists in Cuba today as well.

Midst the newspaper successes, one gloomy note for bagasse newsprint was an attempt to run the stock for *Bohemia*, Cuba's highly successful and mass circulation (about 250,000), satire and humor magazine which uses mainly rotor stock for its high speed presses. A 900 lb. roll of bagasse newsprint was tried out and frequent breaks were reported. However, whether Técnica Cubana now has found a way to use its low tensile, 45 lb. stock for magazine printing, is still not known. But capturing the domestic, daily newspaper market in Havana and then Cuba, with bagasse newsprint, seems to be only a matter of time.

Though this single mill, producing 30,000 tons a year may seem like a small operation, there is prospect of considerable growth. Even during the Batista dictatorship and its press censorship, Havana was one of the major publishing centers of the Americas. *Bohemia* was the only Cuban publication free from Batista's press censors, because of its prestige value as Spanish America's fastest growing, popular magazine. Today, it has an increasing readership in all the Latin American republics, even vies with Time-Life's Spanish editions and Brazil's *O Cruzeiro* for the big American and European advertisers. *Bohemia* alone consumes 10,000 tons of newsprint a year, or one third of Cuba's total annual consumption. Fidel Castro promises an end to all censorship and this will be a spur to more use of newsprint.

Right now, Havana possesses about a dozen morning and evening daily papers compared to the average half dozen dailies of the largest U.S. cities. This reflects the size and relative prosperity of Cuba's middle class. The island republic, even during the revolution was not a poor nation and bought consumer products at an increasing rate and read those publications which exist on consumer-oriented

advertising. Havana is the publishing place for Time-Life's Spanish editions which usually consume what little American newsprint is exported to Cuba.

5. Hardboard, Particle Board and Acoustical Tile

Manufacture and sales of bagasse hardboards are well-advanced. Just over 1 million square feet of bagasse-based acoustical tile had been sold and installed in new Havana and Cuban buildings by Dec. 1st. A merger of young Cuban and American technical and administrative talent and joint capital into Cuban Bagasse Products S.A. of Havana, represents one of the most successful Cuban bagasse end-product manufacturers to date.

The mill of Cuban Bagasse Products S.A. at Cruces, even though it was in rebel-infested Las Villas Province where Castro achieved his decisive victories, has been in full production since June. It has more orders than it can fill. This company also reports rebel interference with shipments of raw materials as well as completed orders from the mill.

The company has already set up an export division, Materiales del Caribe, and shipped an initial order of 100 tons of bagasse board to Caracas on Dec. 10 to commence local manufacture of acoustical tile for the Venezuelan market. A further sales office already exists in Panama City.

As well as making hard, particle and acoustical boards, the company is now marketing a pressed bagasse board under the trade name "Miratex" for the manufacture of quality kitchen, office and dining room furniture. With walnut, mahogany veneers, permanently super-imposed, bagasse boards have most of the features of more expensive boards at a rather startlingly reduced cost.

"Miratex" board of $\frac{1}{2}$ and $\frac{3}{4}$ in. thicknesses, for example, compete in Cuba with "Novaply," a similar product manufactured by the Celotex Corp. (U.S.A.) as follows: Cuban Bagasse $\frac{1}{2}$ in. board, 19¢ sq. ft. Celotex, $\frac{1}{2}$ in. board, 30¢ sq. ft., Cuban Bagasse $\frac{3}{4}$ in. board 25¢ sq. ft., Celotex $\frac{3}{4}$ in. board 40¢ sq. ft. Square foot price differentials of as much as 10¢ to 15¢ account for substantial cost advantage of manufacturing boards from the local raw material.

Nevertheless, Cuban Bagasse Products officials point up the increasing difficulty of obtaining cheap prices from sugar mills for a hitherto almost useless waste material. Bagasse for board manufacture costs the producer about \$16 a ton by the time the fiber is processed, though it is bought at the

mill for \$4 a ton. A heavy water content and the necessity of removing pith by highly specialized, centrifugal de-pithing systems, brings up the cost.

Cuban Bagasse Products, which includes the son of the president of Reichhold Chemicals (U.S.A.) and the son of a leading Cuban insurance executive as vice presidents (and both under 35), today utilizes a dry process which is new to the bagasse field, but is tied in with the production methods for manufacturing particle boards from wood chips. At the Cruces mill, board ranging from light material for acoustical purposes to a product as heavy as a South American hardwood is now turned out and sold. The bagasse particle board will also hold a smoother thin veneer finish than standard particle type boards now made in the U.S.A. and sold in Cuba.

With an option on enough bagasse to keep a 200 ton-per-day operation going, Cuban Bagasse Products says it can now compete against all comers, plywood and lumber included.

6. Paperboard Industry Also Seeks Self-Sufficiency

The future of Cuba's paperboard self-sufficiency depends on the output of Papelera Pulpa Cuba S.A. which has consumed almost half of the total domestic and foreign capital invested in Cuban bagasse mills. Initially announced in early Jan. 1957 as "the first fully integrated pulp and paper project designed specifically for the use of bagasse," Papelera Pulpa will be integrated, when finished, all the way from its present producing sugar mill from which the raw material will come to the finished paper and paperboard, ready for shipment. Production is to include bleached papers and boards of most types, as well as unbleached papers, corrugating board and container board for corrugated boxes. Unknown still, however, is whether the manufacturer will rely on 100% bagasse pulp or will use a mix of bagasse and woodpulp, the latter probably of softwood varieties.

Developer of the integrated equipment line for Papelera Pulpa at Trinidad is the Parsons & Whittemore Inc. organization. The paper machine has been built by the Black-Clawson Co. with a production of 100 tons per day of bleached and unbleached pulp and paper from bagasse. At present, these firms are also heavily committed in other areas of the world where local fibers can be made into newsprint and certain papers, especially in Mexico, North Africa, Portugal and Colombia. The date for commercial production at Papelera Pulpa has now been advanced to mid-1959, two years later

than first statements indicated.

Added to Papelera's inevitable problems of getting as complex a line as this (first of its kind) into operation, was the quickly increasing activities in late 1958 of the Fidel Castro forces in Las Villas Province. A large group of rebel university students in the hills adjacent to the firm's Trinidad mill straddled its communications and it was virtually cut from the outside world for a long period.

Elsewhere in Cuba, a small amount of bagasse paperboard as well as paperboard from bagasse-wood pulp mixes is presently turned out by the Compañía Fibras de Caña in Havana Province and Pulpa de Bagazo S.A.'s new \$3 million plant at Sagua la Grande in Las Villas Province. Like Papelera's operations, this mill suffered during the revolution and figures on 1958 output are therefore not available. Other plants are Cubana Primadera S.A., Camaguey, and Papelera Damuji S.A. near Havana.

7. Fine Papers and Other Bagasse Products

Paradoxically, though bagasse fibers are said to be well suited for fine paper, little publicity has been given

to this. Fine papers from bagasse are not new and have been produced on and off elsewhere in Latin America for about 20 years. In Cuba, it is made locally by Stevens & Thompson Paper Co. at Cotorro in Havana Province.

So far, only Pan American Bagasse Products S.A. of Havana is reported to be making a pith by-product. This is a low cost pith-with-molasses cattle fodder mix. Other pith possibilities include a substitute for certain wheat flours, as filler material in the manufacture of plastic cups and trays, and most colorful of all, as a dried-down substitute for gunpowder.

8. Producers of Bagasse Products in Other Nations

While Cuba today leads all nations in bagasse by-product sales, other nations, chiefly the U.S.A., have manufactured bagasse products for years. Louisiana, the sugar state, is the home of a bagasse wallboard concern, Celotex Corp. and a paper mill, Valentine Pulp & Paper Co., a captive operation of several Louisiana sugar mills.

W. R. Grace & Co., an old hand in the bagasse field, was turning out bagasse papers in the late 1930's. And though it has abandoned construction

of its proposed bagasse pulp mill at Morón in Cuba's Camaguey Province, it will commence operations with a Puerto Rican mill this year and has a paper and paperboard operation at Paramonga in Peru.

Add scattered bagasse paper Mills elsewhere: China, Taiwan, the Philippines, South Africa and India, one planned in Australia and the \$600,000 research activities of Crown Zellerbach Corp. and the Hawaiian Sugar Planters' Association in Honolulu to, "... make most grades of paper from Bagasse," and you have a rounded picture of non-Cuban development.

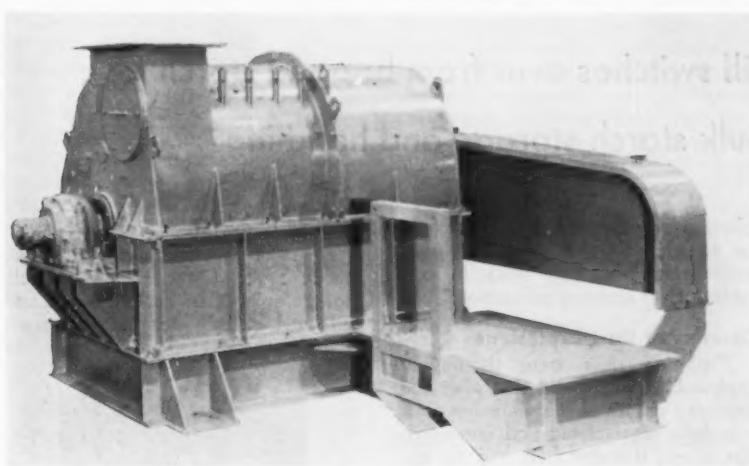
9. CONCLUSION: Bagasse Development Reaches Maturity

With world production of vital bagasse waste reaching perhaps 15 million tons by the end of 1959 (Hawaii and Louisiana state in U.S.A. each produce 1 million tons of it annually), hardly a mark has been made in the vast raw material resource awaiting the bagasse manufacturer and marketer. It takes about a ton of bagasse to produce a ton of paper, ranging in value from \$125 to \$250 a ton, depending on the type of paper, of course. Cuban newsprint, though not yet priced by anyone, will probably sell for about the same as the Canadian import, currently at \$150 a ton at Havana.

The question has often been asked why the bagasse manufacturer of highly competitive items such as newsprint and paperboard cannot offer reduced prices against the imports they hope to supplant. In most Latin American nations these days, motives seem inconsistent, perhaps irrational to the Northern businessman. The nationalistic aspects of achieving self-sufficiency in any vital consumer product, paper being one of the most important, can in the eyes of Latin planners justify the same or even a higher price than the competing and often well-entrenched foreign product.

A well-to-do nation like Cuba can afford such exercises of political expression. For example, the first use of bagasse newsprint in Havana last June, was hailed as "in patriótico" by *Información*, a Havana daily newspaper.

It seems Northern manufacturers of woodpulp based newsprint and papers will not for long have reason to scorn bagasse and its now mature development. This is true, not only because of the record of achievement with bagasse, but also because of the rising consumer market for locally-produced products, by nations which up to now, were considered underdeveloped and illiterate.

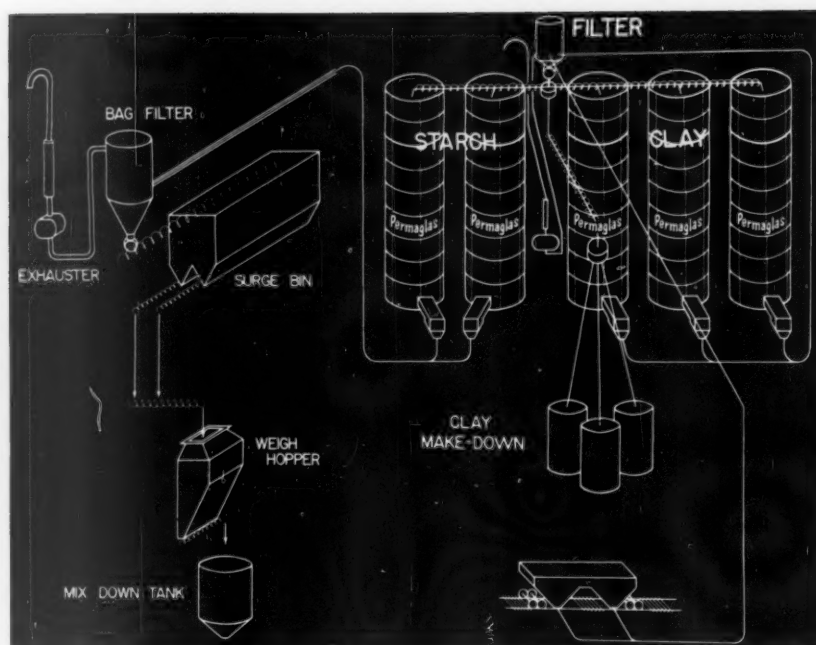


Improves Cuban Bagasse Pulp

Papelera Pulpa-Cuba S.A., which starts up in mid-1959, will receive a high quality of bagasse fiber as a result of the first commercial Horkel mechanical system for removing pith and dirt from bagasse at the sugar mill, which completed a full season of operation at the Central Trinidad sugar mill in Cuba. The resulting depithed, clean bagasse fiber has been baled and stored for utilization by Papelera Pulpa-Cuba, 100 daily-ton bleached bagasse pulp and paper mill.

Key to the new system is the Horkel Depither, a modified swing hammer mill developed at Louisiana State University. The machine is licensed for manufacture by the Parsons & Whitemore-Lyddon organization in New York and London, with exclusive sales rights throughout the world. Two Horkel machines at Central Trinidad handled 250 tons of bagasse (bone dry basis) daily on a sustained around-the-clock schedule, operating throughout the sugar cane grinding season. Removed pith can be retained as fuel, and as it is done at the sugar mill, baling, handling and pulp cooking costs are reduced for the useable fiber.

FLOW CHART for starch and clay at Consolidated Water Power & Paper Co's Biron, Wis., Division.



Bulk Starch Saves \$9,000 a Month

Wisconsin firm's Biron mill switches over from bagged starch to integrated mechanical bulk starch storage and handling

• A bulk materials handling system for starch, believed first in the paper industry, has proven an outstanding success for Consolidated Water Power & Paper Co.'s Biron, Wis., Division Coating Department.

This Biron Division was the focal point of a \$15,000,000 expansion-modernization program (see PULP & PAPER, Feb. 1958, page 62).

Consolidated's plant engineering team faced several problems when they began their studies on bulk starch handling. Starch has individualities that must be carefully considered. Starch supplied by different corn processors have different conversion characteristics, a critical factor in conversion of starch for high solids coatings.

To eliminate difficulties in the processing, the starches from different producers could not be mixed. It was decided the company would limit purchasing to two simultaneous suppliers. Two separate storage facilities would be erected, a separate storage for each starch. If more sup-

pliers were used, the purchase would be scheduled on a quarterly basis, minimizing laboratory work in correcting their enzyme conversions.

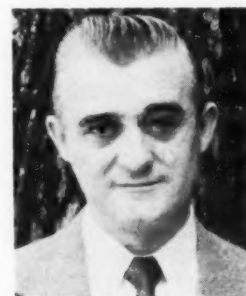
Dangers of Dust Explosions

Explosion risks were thoroughly explored. It was found that after the explosive nature of starch-air mixtures was fully appreciated and corrected, the starch industry had had no explosions in over 20 years. Explosion proof electrical equipment—lights, motors, connections, etc.—plus other safety factors, and maintaining proper housekeeping practices, the engineers agreed, would enable Consolidated to match the starch industry's safety record.

A study of bulk materials handling system was made. The starch would have to flow in the dry state because, unlike clay which could be suspended in water and move, starch had the tendency to settle out unless under constant agitation. As a safety precaution, a vacuum rather than a pressure system was adopted.

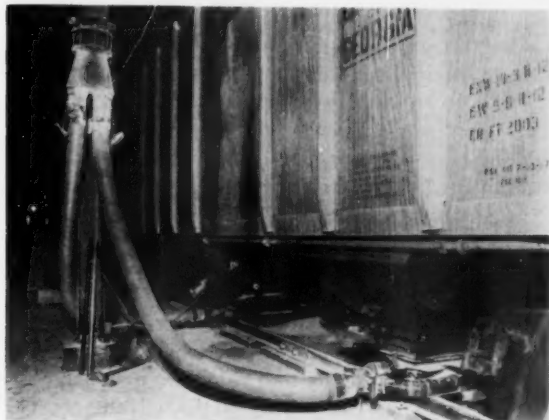
Glass-Coated Steel Storage

Heart of the new facility are two A. O. Smith Corp. Permaglas bulk storage units—glass coated, inside and out, cylindrical storage structures. The specialized glass coatings on

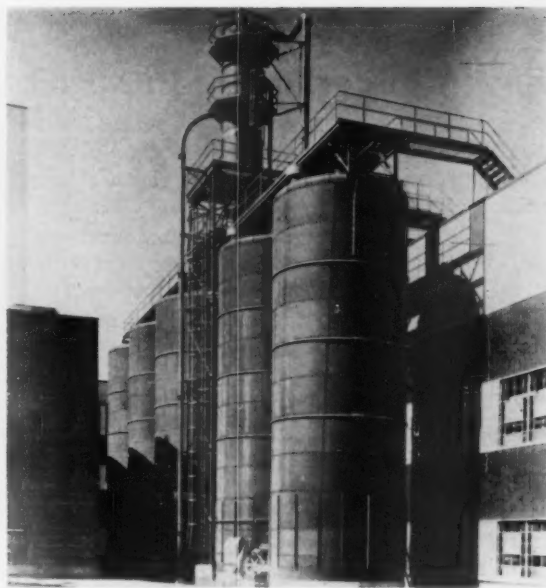


ROBERT MEDER, who recently became division manager at Biron. He worked up from production manager there and formerly held key positions in customer service and production in the parent Wisconsin Rapids mill.

STARCH IS FILTERED through bag filter atop Biron's silos. Two starch silos in foreground, three silos for clay in rear. Pipeline in foreground is starch reclaiming line.



BULK STARCH AND CLAY are unloaded from air slide cars hooked into Dracco Corp. pneumatic system.



their interior provide high protection against contamination, while also simplifying "bin wash-downs" when a change of starch suppliers was scheduled. The solid glass coat gives a weather resistance to the steel, assuring a long life.

The storage units have unique bottom unloaders that lock right in with the rest of the flow system. These mechanized units, operating from center posts and hooked up with the electrical system of the entire facility, assure orderly and uniform flow.

Besides the two Permaglas units for starch, there are three for bulk handling of china clay. Each starch

bin has a capacity of 10,000 cu. ft. Each clay bin holds 14,000 cu. ft.

Starch, as well as clay, is delivered in bulk in rail cars to the Consolidated unloading site. Starch is unloaded to live storage, and clay is delivered to "make down" or dead storage via one large pneumatic system and a system of screw conveyors.

The vacuum system is conventional, having a maximum capacity of 30 tons per hour, and consists of hopper bottom car attachments and pipe line to a bag filter. Passing through the filter, the bulk material drops through a rotary air lock to a three-way turn spout. This spout selects one of a system of conveyors which transport starch to storage, clay to storage, or clay to make down. All starch and clay handling and conveying systems at Biron mill were supplied by Dracco Corp., Cleveland.

Some of the clay is screw conveyed, in dry state, to the Permaglas bulk dead storage structures. It is reclaimed by the mechanical unloader and the same system of pneumatic and screw conveyor as used in car unloading. The unloading system requires about 170 hp.

Starch is drawn from storage via the mechanical loader which deposits its flow into a pneumatic conveyor line extending from the silos to the starch area of the coating department, a distance of some 350 ft. Rate of flow from the silos ranges from 6 to 10 tons/hour, depending on plant needs.

This flow pipe feeds into a small bag filter mounted on top the coating department roof. Here the air is separated from the starch which drops through a rotary air lock onto a screw

conveyor, which feeds into a 20 ton horizontal surge bin. The screw end inside the surge bin has an open bottom so that the starch builds up forming its own bottom.

Two screw conveyors in the "live" bottom of the surge bin deposit the starch on another short feeder screw conveyor. This feeds into a weigh hopper, which dumps into a cold water mix tank. Here the starch is slurred to the correct consistency. It requires about 80 hp to flow bulk starch from silo to mix-down tank.

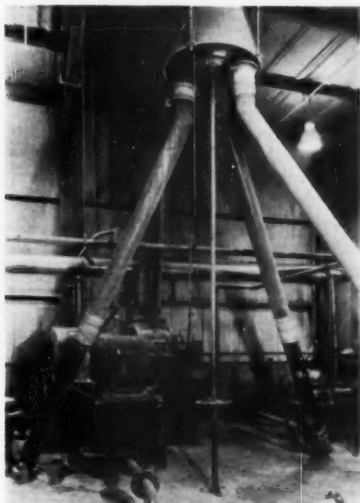
Starch is delivered in carload lots of approximately 40 ton. From the Permaglas bulk storage unit, some 9 tons of material is drawn, three times daily, during full production.

Economies from New System

The plant's manpower needs have been materially reduced by the bulk materials handling system. Economies in purchases have come with materials in bulk, rather than in bag. Space for bagged starch storage has been freed for productive uses. The Permaglas structures require minimum space because of vertical design. The controlled even flow results in production efficiencies.

Consolidated engineers have estimated that in handling starch alone, the new system realized a saving of \$15.00 per ton. For a regular month's operation of 22 days, some \$9,000 is saved.

Additional safety factors added after the initial installation include grounding of the entire system, wires woven into filter bags and chokes between units to provide for immediate containment of an explosion.



MANUAL THREE-WAY TURN SPOUT over make-down tanks at Biron. Car unloading system vacuum pump is at lower center.

Eleven Important Features Characterize Arbiso

1. The Arbiso process is a new method of pulping, based on the use of a single chemical compound, NaHSO_3 .

2. The cooking liquor is characterized by absence of free SO_2 , therefore liquor-making is easy and there is little Free SO_2 to handle during cook.

3. Pulping is easily regulated by time, other factors being held constant.

4. The high-yield chips are soft and refine readily in a disk refiner, with moderate power consumption. At slush yields low tailings are obtained easily.

5. Pulp strength is substantially better for the same wood than with an acid sulfite cook, and for spruce it approaches kraft, except for tear.

6. Practically all species of softwoods and hard-

woods may be cooked, given good penetration of the chips by the liquor.

7. All species may be pulped together, each developing its own strength.

8. The process should be readily adaptable to continuous digesters, since there is no excess pressure from SO_2 gas.

9. The pulp is easily bleachable by conventional methods, and the bleach demand is indicated by the K no., as with acid sulfite pulp.

10. The pulp resembles ordinary sulfite pulp more than other types of fiber, and the cost of changing over a sulfite mill would be nominal.

11. Mill trials have proved the advantages of Arbiso, both in newsprint at high yields and in fine papers after bleaching.

Improved Pulp—Many Uses

Since its discovery, more successful uses have been found. Resembles normal acid sulfite. Printing runs at high speed.

By **ROGER M. DORLAND,**
RAY A. LEASK and
J. W. MCKINNEY*

This article was especially written for PULP & PAPER and is fully copyrighted.

It is the first publication in this country of a complete report on this widely heralded new pulping process.

It brings up to date all the developments in connection with the process since it was first revealed in a paper given before the Technical Section of CPPA a year ago.

INTRODUCTION—A Bisulfite Process, but Different

• The name Arbiso has been given to a cook made with sodium bisulfite, distinguished from the normal acid sulfite cook by the absence of free SO_2 in the cooking liquor. This process as

developed in our laboratories, has been described in two recent papers: Part I covering the use of softwoods¹ and Part II hardwoods.²

Bisulfite pulping in the narrow use of the term, as opposed to acid sulfite, is not a new idea, in fact a laboratory experiment with sodium bisulfite was described by Keller³ in 1885. Later a patent was issued to Marusawa for ammonium bisulfite in 1917,⁴ and another to Dreyfus for sodium bisulfite in 1933,⁵ but these patents were confined to slush yields and did not include refining; moreover, neither of them was sure about being able to cook without adding some excess SO_2 . Magnesium bisulfite was also suggested at an early date, as noted in a literature review by Rue.⁶

More recently the idea of producing high-yield pulp with sodium bisulfite was included in some exploratory

work at the Pulp & Paper Research Institute of Canada. The suggestion was followed up in our laboratories, where it was combined with proper disk refining and eventually led to developing the Arbiso process.

The actual pulping agent in bisulfite cooking is probably the bisulfite ion, which seems to be the active agent in sulfite cooks over the whole range of pH, from normal acid sulfite to neutral sulfite, although the liquor composition in many cases is extremely complex.⁷ We believe that the novelty of the Arbiso process depends on: (a) the simplicity of using a single chemical compound in the liquor— NaHSO_3 ; (b) the advantages of sodium as the base; (c) the recognition of the improved quality of the pulp so produced, especially in the high-yield range where the chips must be refined.

LIQUOR COMPOSITION AND pH:

Sodium Base Preferred; Economics May Decide

Cooking liquor can be prepared on the laboratory scale either from sodium bisulfite or metabisulfite, simply by dissolving the proper amount of

the solid in water. However, neither salt is completely stable on storage so that solutions of the metabisulfite, for example, begin to rise slowly in

*Dr. Dorland is director of research for Abitibi Power & Paper Co. Ltd. Dr. McKinney is associate director of research. Mr. Leask is supervisor of the pulping section.

pH and show a yellow color; at the same time the cook slows down a little.

Since a mill would normally make up the liquor from soda ash and SO_2 , the same procedure was followed in the laboratory, with apparent success.

Our liquors are made up to the point of equal "free" and "combined" SO_2 , as analysed by a modified Palmrose method (CPPA Standard J 1), which of course shows the presence of NaHSO_3 alone. The pH of such solutions depends on the concentration, as shown by Figure 1, which is drawn from the pH found for a number of our cooking liquors; each point represents a group of results in a set varying from three to 12 cooks—it will be seen that the pH varies from 3.5 up to 4.5 and down again to the same level.

Husband⁸ has given a similar curve over the lower concentration range, and also measured the hot pH during the cook, using the Inguber electrode.⁹ We measured only cold pH and found that it dropped by about one point from an original 4.5 during the cook, or less from lower pH levels, then rose again at the blow, to about the same or sometimes a higher value than the original.

A soluble base is necessary for Arbiso, and our experimental work leads us to prefer sodium. The end pH of a bisulfite cook is somewhat lower for magnesium than for sodium, but much lower for ammonia, which may explain why the rate of cooking is increased in the same order. For refined pulps there is a slight loss of brightness for magnesium which becomes quite serious for ammonia, making bleaching difficult, while with slush pulps it is easier to obtain low tailings with sodium. Lithium behaves much like sodium, but in any case commercial use of that base is unlikely. As between sodium and magnesium, economic factors are likely to play a big part in the choice.

PULP HANDLING: For High Yield, Needs Good Refining

Methods of wood preparation and cooking have been given in detail in published papers and need not be repeated. However, for high-yield pulp it is necessary to have good refining, and for that purpose we have installed a Bauer machine with 24-in. disks, fitted with a feed-belt permitting accurate feeding of small quantities of pulp or chips. Usually 10 to 12 pounds is available, but as little as three pounds can be used. By de-watering and re-passing a sample, any desired

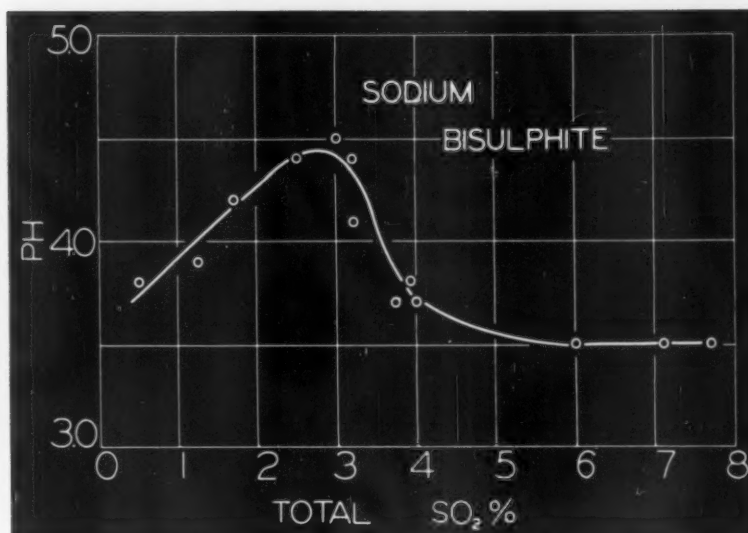


FIGURE 1

degree of refining can be given, and more important, defibration is uniform and the results reproducible.

Test sheets are made on the Noble

and Wood machine, giving a sheet of lower density and strength than the British machine; otherwise all tests are by TAPPI standards.

DISCUSSION OF PULPING RESULTS—Most Species Can Be Cooked; Has Strength Advantages

(a) Penetration

Some form of assisted penetration must be used for best results, although it is true that the penalty is seen as dark centers in the cooked chips and this affects first the brightness, then the K no., and eventually lowers the strength.

For most of the work Va-purge was used,¹⁰ although a vacuum sequence developed in the laboratory proved equally effective. Wood density is a major factor: poplar is easier to penetrate than spruce, but the dense hardwoods are much harder, somewhat in proportion to density. For the dense species, cutting shorter chips can help materially, and a longer period of heating up to temperature also assists penetration.

(b) Cooking Variables

The chemical usage does not seem to affect the speed of the cook, but chemical exhaustion at the end must be avoided on pain of loss in brightness and yield (shown in higher K no. and lignin for any specific yield). This effect can easily be missed in high-yield pulps unless careful comparisons at the same yield are made.

Chemical concentration does affect cooking rate, however. Most of our cooks were made at a liquor/wood ratio of 4, but at a ratio of 5 (lower concentration) cooking is slower, while at 3 it is faster, if chemical usage is kept constant.

But more profound changes in pH result from allowing an excess or deficiency of apparent free SO_2 , and decided changes in cooking rate follow. Over a short range these changes are linear and can be compensated by the time, but larger variations give greater changes in cooking rate and eventually affect pulp quality.

Almost all of our cooking was done at temperatures above 140°C (284°F), a fact which reflects the slower rate of cooking compared to acid sulfite, due to the higher pH. Raising the temperature has little effect on strength, but may increase lignin, although this effect seems to depend on wood density and so may be due to imperfect penetration. Cooking in continuous digesters, therefore, may be possible.

(c) Yield

Yield depends strictly on time, as long as other factors are kept constant, and with a good refiner the chips can be defibered without fiber breakage, although with increasing power consumption, especially above 75% yield. Yield determination with hard chips requires special precautions.¹

Arbiso chips are softer than high-yield sulfite and so take less power, but power also varies with species, hardwoods taking decidedly less than softwoods at any given yield. As yield decreases, more and more free fiber

ARBISO

appears and in the range of 55-60% it becomes possible to screen the pulp, but economic amounts of tailings are reached only at a somewhat lower level, again depending strongly on species. Thus poplar gives low tailings at 55% or even higher, birch and spruce at about 48-50% and maple at about 45% no. 1 yield.

An experiment was made to determine any effect on cooking rate or quality when two species were cooked together. Spruce and poplar were cooked separately, all conditions being kept the same—of course poplar gave a lower yield and K no. Then spruce and poplar were cooked in the same digester, but with the chips separated by a stainless screen; the pulps were then separated and tested, showing the same yields and properties as when they were cooked separately.

| | Sulfite | | Arbiso | |
|-------------------|---------|-------|--------|-------|
| | Spruce | Birch | Spruce | Birch |
| Initial | | | | |
| C S Freeness, ML. | 705 | 665 | 680 | 675 |
| Burst Factor | 36 | 13 | 45 | 15 |
| Tear Factor | 115 | 48 | 135 | 70 |
| Strength Number | 151 | 61 | 180 | 85 |
| At 500 ml. | | | | |
| Burst Factor | 59 | 26 | 75 | 40 |
| Tear Factor | 85 | 58 | 91 | 85 |
| Strength Number | 144 | 84 | 166 | 125 |

rately. Thus there is no interaction when wood mixtures are cooked with bisulfite.

Pulp Strength

A variety of strength tests are made on our handsheets, but we depend largely on the mullen and tear, calculated as TAPPI burst factor and tear factor, as well as the sum of the two, which we call strength number. Table I will give an idea of the magnitude of these factors as well as a comparison

son between acid sulfite and Arbiso, the pulps being from laboratory cooks in all cases and not previously dried.

This shows the advantage for Arbiso in tear, which is maintained during beating. It also illustrates the tendency of hardwoods to increase in tear during the first stages of beating, in contrast to softwoods, a pattern followed by most hardwood species. Arbiso pulps beat faster than sulfites.

As for sulfite, the strength of slush Arbiso pulps declines somewhat with K no. For refined pulps it is important to compare strength at the same freeness, because further refining acts like beating, but strength seems to rise slowly with yield, to a maximum above 60%, after which any decline is slow, for spruce, until yields above 75% are reached. Hardwood strength falls off at a lower level, but species has a strong effect, with few species being as strong as birch and some of them much weaker.

LABORATORY COOKING RESULTS—Results Shown from Spruce Arbiso Cooks

Table II includes a few typical spruce Arbiso cooks, four being refined and four screened. The refined pulps are a yield series, that is, all conditions were kept constant except time, to obtain a decreasing yield, and it will be seen that yield, K no. and lignin decline through a substantial range as time increases. But brightness and strength change much less, although strength shows some random variations. However, these are much reduced after beating.

The slush pulps also form a yield

series with time, but over a smaller range, and it should be noted that No. 1 yield declines less than total, due to a reduction in tailings. K no. is lower than for the refined pulps and brightness better; the higher pentosan content must be due to a change in the wood supply. No consistent differences in strength can be seen. Note that "%NaHSO₃" in these tables refers to chemical applied rather than chemical consumed.

Table III deals with hardwoods, in many cases in mixtures. The first two

cooks use mixed birch and poplar, and the results are quite good, with satisfactory strength. The next two use a mixture of spruce with poplar, and the good effect of the spruce on freeness and strength is evident. Cooks 15 and 16 use a mixture of poplar, birch and maple, again cooked at 155° like the first pair, and the effect of the maple is shown first in the low freeness and second in the lower strength.

The last two cooks compare poplar and white birch at slush yields. The

| COOK NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------------------------|------|------|------|------|------|------|------|------|
| NAHSO ₃ B. ON WOOD, % | 18 | 18 | 18 | 18 | 20 | 20 | 20 | 20 |
| FREE SO ₂ , % | 1.39 | 1.40 | 1.40 | 1.40 | 1.55 | 1.54 | 1.55 | 1.54 |
| COMBINED SO ₂ , % | 1.40 | 1.39 | 1.40 | 1.40 | 1.55 | 1.54 | 1.55 | 1.54 |
| HOURS UP TO 165°C | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 |
| HOURS AT 165° C | 1.5 | 2 | 2.25 | 2.75 | 2.75 | 3 | 3.25 | 3.5 |
| INITIAL PH | 4.4 | 4.4 | 4.4 | 4.4 | 4.1 | 4.2 | 4.1 | 4.1 |
| FINAL PH | 3.7 | 3.7 | 3.5 | 3.5 | 4.0 | 4.0 | 4.0 | 3.7 |
| YIELD, TOTAL, % | 62 | 60 | 54 | 51 | 51.6 | 50.2 | 50.1 | 48.7 |
| YIELD, NO. 1, % | - | - | - | - | 49.8 | 49.0 | 48.8 | 47.6 |
| K NO. (QUARTER-GRAM) | 60 | 51 | 42 | 35 | 23.8 | 20.3 | 19.0 | 16.8 |
| BRIGHTNESS, GE | 55 | 56 | 59 | 59 | 62 | 62 | 63 | 61 |
| PENTOSANS, % | 4.2 | 4.3 | 4.6 | 4.0 | 5.8 | 5.6 | 5.6 | 5.3 |
| LIGNIN (KLASON), % | 15.8 | 12.4 | 9.3 | 7.0 | 4.0 | 3.0 | 2.6 | 1.7 |
| C S FREENESS, ML. | 685 | 680 | 670 | 680 | 685 | 675 | 685 | 680 |
| BURST FACTOR, INITIAL | 48 | 57 | 57 | 51 | 50 | 49 | 47 | 43 |
| TEAR FACTOR, INITIAL | 120 | 101 | 135 | 125 | 136 | 124 | 127 | 127 |
| STRENGTH NO., INITIAL | 168 | 158 | 192 | 176 | 186 | 173 | 174 | 170 |
| STRENGTH NO., 500 ML. | 161 | 168 | 171 | 162 | 159 | 162 | 166 | 161 |
| STRENGTH NO., 300 ML. | 149 | 161 | 161 | 156 | 156 | 156 | 157 | 151 |

TABLE II—SPRUCE ARBISO PULPING
Wood charge—18 lbs., dry basis. Liquor/wood ratio—4.0

| COOK NO. | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|----------------------------------|------|------|------|------|------|------|------|------|
| SPECIES, % BY WEIGHT | | | | | | | | |
| SPRUCE | - | - | 60 | 60 | - | - | - | - |
| POPLAR | 40 | 40 | 40 | 40 | 20 | 20 | 100 | - |
| BIRCH | 60 | 60 | - | - | 40 | 40 | - | 100 |
| MAPLE | - | - | - | - | 40 | 40 | - | - |
| NAHSO ₃ B. ON WOOD, % | 16 | 16 | 18 | 18 | 16 | 16 | 20 | 24 |
| FREE SO ₂ , % | 1.24 | 1.25 | 1.41 | 1.42 | 1.24 | 1.23 | 1.55 | 1.86 |
| COMBINED SO ₂ , % | 1.25 | 1.25 | 1.42 | 1.42 | 1.24 | 1.25 | 1.55 | 1.86 |
| MAXIMUM TEMPERATURE, °C | 155 | 155 | 165 | 165 | 155 | 155 | 165 | 165 |
| HOURS UP TO MAXIMUM | 1 | 1 | 1.25 | 1.25 | 1.5 | 1.5 | 2.5 | 1.25 |
| HOURS AT MAXIMUM | 2 | 2.5 | 1 | 2.5 | 1.5 | 4 | 1.5 | 3 |
| YIELD, TOTAL, % | 64 | 61 | 68 | 53 | 67 | 56 | 57.4 | 48.4 |
| YIELD, NO. 1, % | - | - | - | - | - | - | 55.3 | 47.0 |
| K NO. (QUARTER-GRAM) | 39 | 34 | 57 | 27 | 53 | 26 | 16.3 | 18.6 |
| BRIGHTNESS, GE | 57 | 57 | 53 | 61 | 45 | 56 | 60 | 52 |
| PENTOSANS, % | 12.7 | 11.8 | 6.9 | 6.2 | 13.7 | 10.7 | 7.9 | 10.4 |
| LIGNIN (KLASON), % | 8.0 | 6.7 | 14.5 | 4.3 | 12.1 | 4.6 | 2.2 | 2.3 |
| C S FREENESS, ML. | 600 | 570 | 660 | 675 | 450 | 490 | 600 | 660 |
| BURST FACTOR, INITIAL | 33 | 40 | 34 | 29 | 28 | 33 | 19 | 17 |
| TEAR FACTOR, INITIAL | 82 | 86 | 103 | 111 | 61 | 74 | 51 | 70 |
| STRENGTH NO. INITIAL | 115 | 126 | 137 | 140 | 89 | 107 | 70 | 87 |
| STRENGTH NO. 500 ML. | 128 | 129 | 120 | 144 | - | - | 93 | 132 |
| STRENGTH NO. 300 ML. | 124 | 127 | 121 | 140 | - | - | 114 | 135 |

TABLE III—HARDWOOD ARBISO PULPING

short cooking time and high yield of poplar are notable, confirming other results obtained with acid sulfite liquor. Poplar also gives lower tailings and the lower pentosan value is characteristic. Initial strength is not too much higher for birch, but the free-

ness difference should be noted, and as beating progresses the birch gains more than the poplar. This table shows quite clearly the way strength number rises on beating with the hardwood species, as well as the favorable results obtained with mixtures.

tion was better, although only two purges were used in the mill—no doubt this is due to the longer heating period. And strength was always a bit lower, following the common experience of comparing mill and laboratory pulps. The hardwood freenesses were lower than would be the case with a proper slush handling system.

(c) Bleaching

The mill bleachery used the conventional three stages of chlorine, caustic and hypochlorite, and handled the Arbis pulps without difficulty, using the K no. as a guide for bleach consumption. The strength number of the bleached pulps was unchanged, but in some cases there was a drop in burst coupled with a rise in tear. With the hardwoods there was no sign of the increase in strength which occurs on bleaching a hardwood NSSC pulp, but on the other hand the tendency was toward an increase, not a decrease, in freeness.

(d) Paper Machine Trials

Several of the Arbis pulps were tried in different types of furnish, with a run of sufficient duration to bring the machine to uniform operation. In one case unbleached spruce Arbis (63% yield) was used as the main portion of the furnish, to replace unbleached spruce sulfite: an excellent sheet was produced with substantially higher strength.

Another trial used bleached spruce Arbis to replace purchased kraft in a mixed furnish: no difference in strength or behavior could be seen, but of course the kraft had lost some

MILL TRIALS—Brighter, Cleaner Pulp, Even with High Yields

(a) High Yields

One of the Abitibi mills which normally makes high-yield sulfite was switched over to Arbis for a period of four months. No changes in mill operation were necessary, since they were already equipped with a complete refiner system and could use soda ash for liquor-making.

Cooking was adapted to mill practice, that is, no penetration aid was used: the digester was filled with liquor and cooked with direct steam, wet relief being taken off in the usual manner. The results showed that waste and refining power were lower than for soda-base high-yield sulfite, and the pulp was brighter and cleaner, in spite of substantially higher yields. No changes were noted on the paper machines, but the sheet was cleaner. Long runs were made with large additions of jackpine and hardwoods without any deterioration either in the pulp or the paper.

(b) Slush Yields

During this period week-end cooks were made to try the effect of softwoods, hardwoods and various mixtures, most of the cooks being screen-

able. This work was hampered by the absence of slush handling equipment in the mill, so that all pulp had to pass through the refiners. However, with the plates backed off not too much work was done on the stock; there was no knotting, but the centrifugal cleaners gave a clean pulp, which could be lapped and then shipped to a fine paper mill for bleaching and paper machine trials. Some of these cooking results are given in Table IV.

It was not possible to duplicate laboratory conditions exactly, since a mill digester cannot be heated up as fast, but with due allowance for that change, the mill cooks correspond closely to those in the laboratory. For higher yields a temperature of 155° was used, while for slush yields the temperature was raised to about 165°, which increased the rate of cooking enough to complete the cycle in the same time as a standard sulfite cook, thereby avoiding any loss in production.

Analysis of the pulps showed that the results were parallel to similar cooks in the laboratory, but penetra-

ARBISO

strength in drying. In a third trial the Arbiso pulp was made from a mixture of 20% spruce with hardwood and replaced the normal spruce sulfite component; there was no difference in paper strength and a possible improvement in formation.

Observations during printing trials with these papers, in one case on a high-speed press, failed to show any difference in behavior, which means that they were at least as good as the standard grades.

(e) Recovery of Cooking Chemicals

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The cooking of mixed species has proved entirely feasible.

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References

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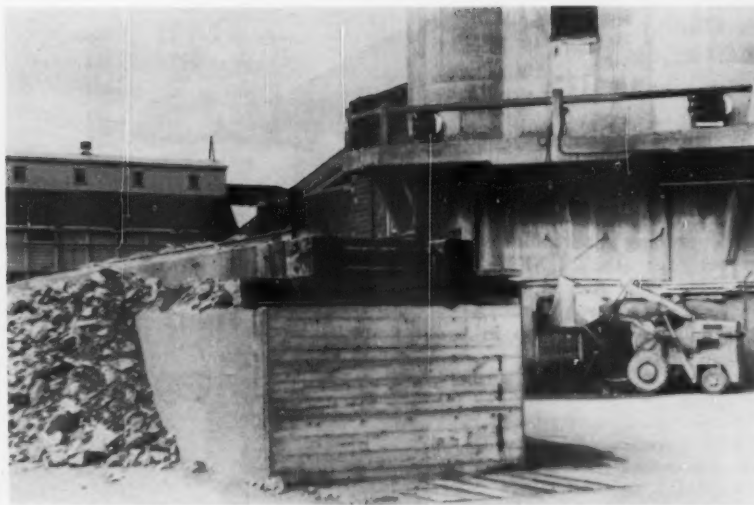
| COOK NO. | M1 | M2 | M4 | M5 | M11 | M12 | M14 | M15 |
|-------------------------------|------|------|------|------|------|------|------|------|
| SPRUCE, VOLUME % | 100 | 100 | 100 | 100 | - | 20 | - | - |
| POPLAR, VOLUME % | - | - | - | - | 50 | 40 | 70 | 70 |
| WHITE BIRCH, VOL. % | - | - | - | - | 50 | 40 | 30 | 30 |
| NAHSO ₃ S./WOOD, % | 16 | 18 | 19 | 20 | 18 | 18 | 19 | 21 |
| FREE SO ₂ , % | 1.21 | 1.45 | 1.46 | 1.77 | 1.33 | 1.38 | 1.58 | 1.76 |
| COMBINED SO ₂ , % | 1.21 | 1.45 | 1.65 | 1.76 | 1.37 | 1.42 | 1.45 | 1.72 |
| MAXIMUM TEMP. °C | 155 | 165 | 170 | 165 | 165 | 165 | 166 | 165 |
| UP TO MAXIMUM, HOURS | 2.2 | 2.5 | 3.3 | 3.6 | 3.6 | 3.8 | 4.5 | 7.2 |
| AT MAXIMUM, HOURS | 2.25 | 2.5 | 1.8 | 2.5 | 2.2 | 1.8 | 1.1 | 0.9 |
| BLOWDOWN, HOURS | 0.4 | 1.0 | 0.75 | 1.0 | 0.9 | 0.8 | 0.8 | 1.0 |
| YIELD (ESTIMATED), % | 63 | 50 | 50 | 48 | 50 | 52 | 54 | 50 |
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| K NO. (QUARTER-GRAM) | 62 | 30 | 20 | 16 | 19.2 | 25.3 | 22.7 | 19.6 |
| BRIGHTNESS, GE | 45 | 56 | 57 | 59 | 52 | 51 | 54 | 56 |
| LIGNIN (KLASON), % | 18.3 | 5.3 | 4.4 | 2.2 | - | 6.1 | 4.3 | 2.2 |
| C.S. FREENESS, ML. | 680 | 650 | 660 | 650 | 550 | 540 | 560 | 495 |
| BURST FACTOR, INITIAL | 44 | 43 | 34 | 42 | 19 | 34 | 21 | 21 |
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TABLE IV—MILL EXPERIMENTAL COOKS

Efficient Materials Handling

at Puget Pulp & Timber sulfite mill in Bellingham, Wash.

Limerock system has "eliminated a lot of hard work and reduced maintenance 90%," says Plant Engr. Daniel M. Robbins. The job, which formerly required six men with wheelbarrows to keep four acid towers supplied, is now done with time to spare by one operator and rubber-tired loader.



LIMEROCK ARRIVING BY RAIL CAR discharges to either side of elevated track onto concrete storage-loading apron for transport to one of two acid towers by Clark-Michigan loader equipped with $\frac{3}{4}$ yd. hydraulic scoop.



LOADER ARRIVES AT STATION. Operator pushes button on tower to start automatic elevating-washing-dumping cycle. In tower shaft, a skip hoist starts to top with previous load. This is starting-control point so operator can visually check each skipload before hoisting.



DUMPING SCOOPFUL OF LIMEROCK into washing hopper, an open-topped steel cage with slotted bottom and end so wash water runs through rapidly, carrying dirt and fines with it. Tripping control button (in previous picture) started shower, which continues after loader leaves.



SHOWER WATER SHUTS OFF automatically (it happened just as this picture was taken) on completion of washing stage of cycle. Meanwhile the skip hoist makes its trip to top of towers, automatically dumps, then descends.



AT BOTTOM OF SHAFT skip activates hydraulic dumper which tilts washer hopper and discharges limerock. "Rock handler" is back with another load ready to inspect resultant skip load and engage controls for new cycle.

ARBISO

strength in drying. In a third trial the Arbiso pulp was made from a mixture of 20% spruce with hardwood and replaced the normal spruce sulfite component; there was no difference in paper strength and a possible improvement in formation.

Observations during printing trials with these papers, in one case on a high-speed press, failed to show any difference in behavior, which means that they were at least as good as the standard grades.

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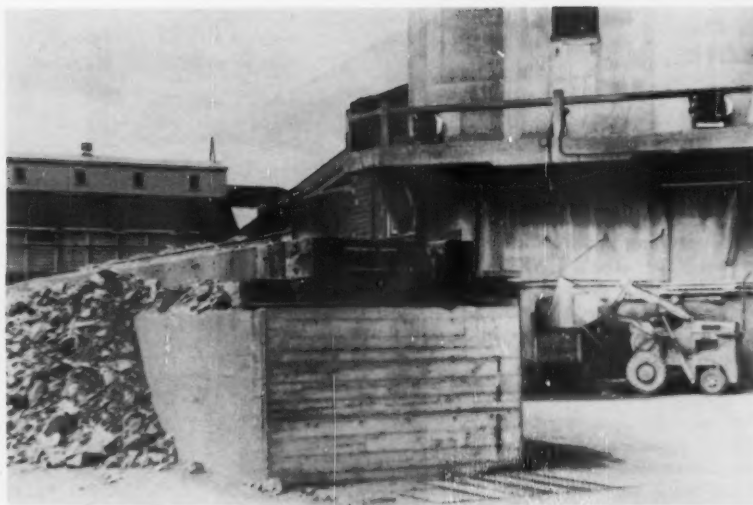
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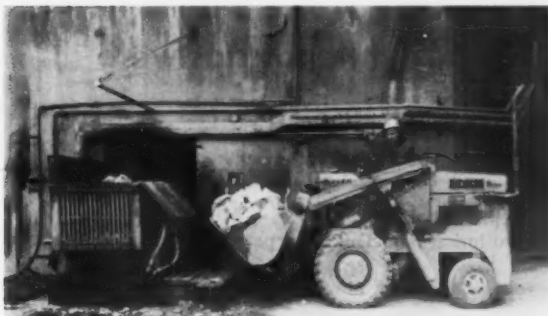
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SAM DUK PAPER MILL, Anyang, was first assignment for Mr. Magnus in his work as supervising paper mill engineer for the UNKRA. Working with Korean technicians and "green" crews, the mill was started up in record time.



Restoring Korea's Mills

A personal experience story reveals how great handicaps were overcome in the rapid reconstruction of Korean industry

By **CARL MAGNUS**
Supervising Engineer from U.S.A.

—Seoul, Korea

● I arrived in South Korea in June, 1958. My assignment with UNKRA (United Nations Korean Reconstruction Agency) was as supervising paper mill engineer on the Sam Duk Shi Heung mills near Seoul.

The Sam Duk mill is at Anyang, an industrial city of 40,000 about 20 miles south of Seoul. It operates a 90-in. modified Yankee on waste papers, hemp and straw, and has a new Home Fourdrinier. The balance of the machine is second-hand from the U.S.A., much of it rebuilt on location. It will produce bond, writing and book text offset for the modern printing plant built by UNKRA and now operating successfully in Seoul.

The Shi Heung Mill is near Ascom. It has a corrugating and carton plant, using kraft from the U. S. A. With UNKRA help, this mill is installing a rebuilt 160-in. Pusey & Jones Fourdrinier and auxiliary equipment. This machine will use local hemp and imported kraft pulp to produce principally multiwall bags. Pulpwood is scarce here but a good quality of hemp is grown and crops could be greatly increased.

Highlights of the Magnus "Diary"

1. Korean assignment—restoring Sam Duk (fine papers) and Shi Heung mills (board products).
2. Sampoong mill is rehabilitated and now makes one-third of South Korea's newsprint needs.
3. Korean Paper Mfg. Co., largest in country, now makes 1,200 tons a month of newsprint from pine.
4. Another newsprint mill is being built; will make 6,000 tons a year.
5. Government Printing Agency mill is very modern; makes currency and cigaret paper for the Republic.
6. Women mix and carry mortar for brick masons working on new mills.
7. Korean operators invented a pipe spreader which controlled calender and reel wrinkles.
8. New trade union does campaigning and speechmaking on company time.

Expands, despite Handicaps

Rapid expansion and modernization, in the face of almost overwhelming odds is the order of the day in South Korea's pulp and paper industry. One primary objective is to supply the country's newsprint requirements. Three new mills will come close to achieving this goal.

I inspected the new newsprint mill of Sampoong Paper Co. shortly before it started operating. An ICA sponsored project has rehabilitated this mill and it is now able to produce about one-third of domestic newsprint demand when in full operation. It has all new German equipment of the latest design.

I have seen many faster, larger machines but I have seen no finer mill nor better all-round engineering.

The Korean Paper Mfg. Co., the largest paper mill in the country, produces about 1,200 tons of newsprint a month. It has its own groundwood mill using native pine. It is well-equipped, excellently operated and its management is fully informed on the most modern equipment and techniques.

A third mill, also being built under the ICA aid program, will have a capacity of 6,000 tons per year. These three plants will save about \$3,000,000 for both the U. S. A. and South Korean governments. About 70% of

the raw materials for the mills will come from local sources, leaving only 30% to be met by importing pulp.

Crash Program at Sam Duk

We embarked on a "crash" program trying to get the new Fourdrinier at Sam Duk ready for startup on July 17, Korea's Constitution Day, a national holiday comparable to the American 4th of July. We thought we had everything all set at about 11:30 p. m., started the wire and then found no tube rolls turning. These have a concentric roller bearing, not self-aligning, that was unfamiliar to all of us. We finally quit at 6:30 a. m. on July 18.

Several days later we started the machine. In spite of continued couch roll clutch trouble, we got good bond paper on the reel. There was general rejoicing over this historic event—the first production of bond paper in Korea. We tried another shake-down test a couple of days later but encountered vacuum trouble. We discovered a bad leak on the suction couch line.

On July 29 we had a successful test run of 15 lb. white writing with a formula of 90% sulfite and 10% broke. We had some speed variation and found that the chief electrician had not followed instructions. He was operating two banks of two transformers on open delta with 80% of the load on one bank. He was instructed to operate three transformers, closed delta with one spare.

ROK Mill is Very Modern

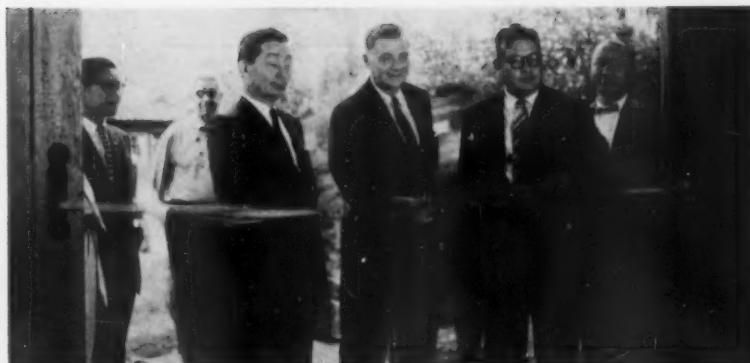
The next day we visited the Korean Government Printing Agency paper mill and were impressed to find such a complete, modern paper mill, built by Sandy Hill Iron and Brass Works of Hudson Falls, N. Y., to produce currency and cigaret paper for ROK (the Republic of Korea). The stock preparation equipment was supplied by E. D. Jones & Sons Co., Pittsfield, Mass., U. S. A.

Mr. Kim, general manager of the mill, and Jim Talmadge from Saugerties, N. Y. U. S. A., chief papermaker, received us cordially.

Mr. Kim and Mr. Talmadge visited us at Sam Duk to inspect the mill, especially the paper machine. We agreed upon adjustments and stock preparation. In spite of some difficulties, we had a fine test run of real No. 1 sulfite writing, perfect formation at 200 ft. with a green crew.

Women Help in Work

I was much interested in watching Korean workers reset the No. 2 boiler at Sam Duk, a job supervised by an outside contractor. It was good brick



Nam Magnus Limb Coulter Kim Cho

OFFICIAL OPENING OF SAM DUK MILL in Anyang, Korea, was attended by Mr. Nam, chief, chemical section, Ministry of Commerce and Industry, ROK; Carl Magnus, supervising mill engineer, UNKRA; Ben C. Limb, Ambassador to the United Nations, ROK; John B. Coulter, Lt. Gen. USA (Ret.) and agent general, UNKRA; Il Hwan Kim, minister of commerce and industry; and Kyung Mook Cho, pres. of Sam Duk.



Magnus Coulter Limb Kim

FIRST BOND PAPER EVER PRODUCED IN KOREA is inspected by Messrs. Magnus, Coulter, Limb and Kim. Even Mr. Magnus' jeep, dubbed "Rock and Roll Lean," contributed to the success of the official opening by hauling two-wheel trailers carrying shipping rolls to the warehouse. Each employee was given a 100-lb. bag of rice in appreciation of their hard work in starting production.



RELAX AND REJOICE is order of the day for Mr. Magnus (at top left) and visiting officials after touring the Sam Duk mill at its opening. Mr. Kim and Mr. Coulter are two gentlemen to right of Mr. Magnus.

KOREA

work. Women mix the "mud" and carry the mortar and bricks to the masons.

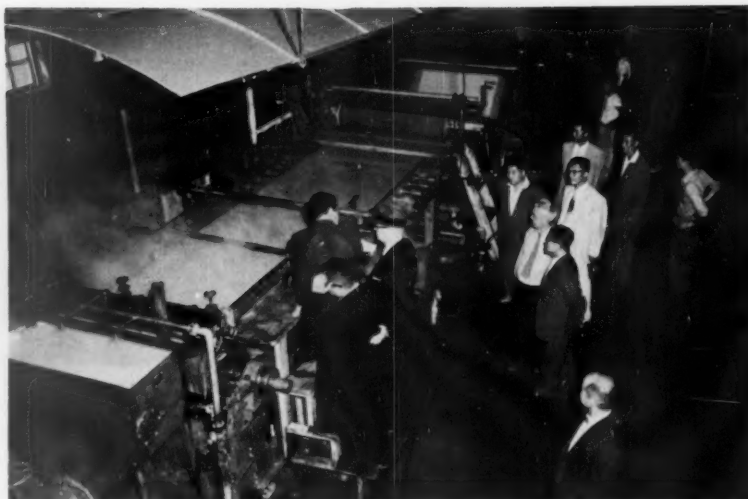
We made our first real trial run of No. 1 bond on August 9. We used a furnish of 50% Soundview (U. S. A.) pulp and 50% broke. On August 12 we had trouble galore—general electrical trouble, water pressure on showers less than 8 lbs., Hydrafiner line plugged, and so on. We finally got started with a good sheet except for an overdose of fine dirt which was supplied to customers at no extra charge.

That was also Plant Election Day. Employees organized a new trade union and elected delegates from each department.

The next day we made our best paper to date, using 50% sulfite and 50% broke. We finally got calender and reel wrinkles under control. Machinetender Lee and Draftsman Lee developed a new pipe spreader which does the trick.

The mill was shut down at 3 p. m., except for the Fourdrinier crew who were not yet union members, for the first general meeting of the new trade union. Pres. Kyung Mook Cho, Vice Pres. Abu and Supt. Yoon attended.

The official opening was held Aug. 16. We got the paper machine started at about 10:30 a.m. with 100% soundview pulp furnish. The "big brass" came at 4:30 p. m.—Gen. J. B. Coulter, Agent General of UNKRA, Ambassador Ben Limb and Minister Kim.



NEW HORNE FOURDRINIER, installed at Sam Duk Paper Mill with ICA assistance, produces rag content bond and other high-grade papers. The mill also produces a variety of Yankee machine specialties. Because of a general power shortage, all industries are cut off from 7 to 11 p.m. to provide electricity to residential users. Thus the mill runs for 20 hrs. daily on two shifts.

Story of Restoration Came in Diary Notes

The story on these pages of Korea's pulp and paper rehabilitation was pieced together from diary notes sent to PULP & PAPER and PULP & PAPER INTERNATIONAL by Carl Magnus, a veteran papermaker of many years experience.

His home is Nincar Lodge, Johnson, Vermont, U. S. A.

Mr. Magnus is a graduate of the University of Maine. He held posts as manager or superintendent of mills in Wisconsin, Ohio and other states. He spent some time in Venezuela years ago as pulp and paper consultant to the government. He has been a consultant in research and development as vice pres. of Calkin & Bayley and now conducts his own management consulting business from his Vermont home.

How a Korean is Trained in U.S.A.

Too Man Park, grinder room foreman in the Korea Paper Mfg. Co., Ltd., mill at Kunsan City, Korea, will have a lot to tell his family, friends and particularly his fellow workers at the mill when he returns to Korea this spring.

Mr. Park came to the United States in February, 1958, for a year's training in pulp and paper production, bleaching, drying and finishing processes, as well as personnel relations. Sponsored by the U. S. Government's International Cooperation Administration, Mr. Park's training program was arranged by the Bureau of Apprenticeship and Training of the U. S. Dept. of Labor.

He spent several months in paper mills in Oregon, followed by visits to various plants where papermaking machinery is manufactured in the Chicago area and Beloit Iron Works, Beloit, Wis., and a week at Wausau

Paper Mills Co. at Brokaw, Wis.

Korea is making a valiant effort to build up her local industries in order to supply as much of her domestic needs as possible. Considerable U.S. aid has been directed toward rehabilitation and expansion of Korea's paper industry. Mr. Park's visit is specifically directed toward this end.

One of the two Fourdrinier paper machines at the Kunsan City mill was destroyed during the Korean War but has since been put back into operation. The entire output of the mill is newsprint for domestic consumption. The plant includes a groundwood mill which uses red pine from forests in the mountainous area southeast of Kunsan City, where North Koreans were occasionally entrenched during the war. As a result, many trees contain shrapnel, adding problems to Mr. Park and other grinder room workers.

Workmen in Korean mills receive 10

cents an hour, plus incentive payments, Mr. Park says. The Kunsan City mill employs 372 persons.

Mr. Park received a diploma in mathematics from Yon Hi University in 1949, and was a corporal in the Republic of Korea army.



Park Gisselman
TRAINING IN U.S.A., Too Man Park, grinder room foreman of Korea Paper Mfg. Co., compares notes with Ejnar Gisselman, sulfite mill supt. at Wausau Paper Mills Co., Brokaw, Wis.

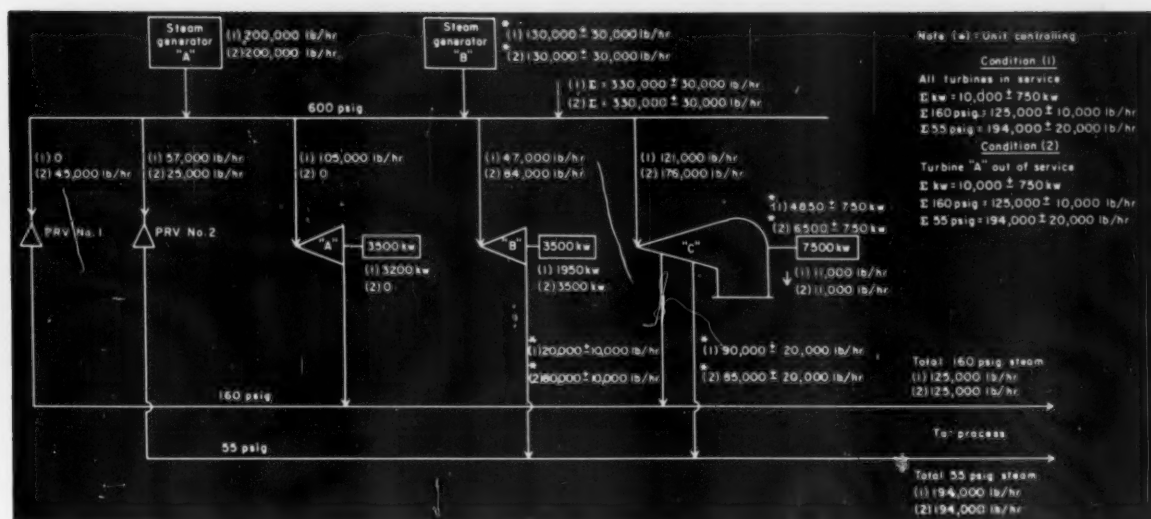


FIG. 1—POWER BALANCE DIAGRAM . . . "Savings are possible . . . will help in . . .

Getting Most for Fuel Dollar

Standard operating procedures go far in minimizing costs of steam and power generating systems in pulp and paper mills

By V. T. DIMITROFF

Control Design Engineer, Medium Steam Turbine, Generator and Gear Dept., General Electric Co., Lynn, Mass.

• More and more articles are appearing these days on ways to use digital computers and process controls to automatically run paper and pulp mills and reduce manufacturing cost. This represents the ultimate in automation at the present time, and perhaps there are benefits in such a process control system for you; however, before installing one of these electronic wizards, the use of a few basic operating rules may help to reduce the operating costs of your steam and power generation equipment.

Establishing standard operating procedures for various conditions can accomplish a great deal in improving plant economy on a yearly basis. The turbine control systems will maintain continuity of operation during most transient periods, but may not have broad enough scope to keep the whole steam and power generation system working at best economy. The standard procedures will permit station

personnel to make the necessary adjustments to bring the overall plant back to best efficiency.

The following conditions are examples where savings are possible using planned operating procedures:

1. Purchasing power from a utility which could be generated in part by steam passing through reducing valves rather than through the turbines.
2. Generating power in the turbine condensing sections when steam is passing through reducing valves rather than through the turbine non-condensing sections.
3. Purchasing power when plant turbines are not loaded to generate maximum power from available process steam.
4. Maintaining process header steam pressure higher than necessary resulting in less turbine output in the non-condensing sections.
5. Planning boiler or turbine outages to achieve best economy as well as operational continuity.

Analysis of Flow Balance

A relatively simple analysis of the power-steam flow balance has been laid out for a 3-turbine plant to show how some of these economies may be realized. The analysis covers the load-

ing of the steam turbines and setting pressure reducing valve flows to achieve the best economy and operation.

Figure 1 shows a simplified diagram of the turbines, piping, and boilers. The turbines are rated as follows:

Turbine "A" 3500 kw (600#G inlet 160#G exhaust, approx. steam rate = 33 lbs/hr. per kw-hr.)

Turbine "B" 3500 kw (600#G inlet 55#G exhaust, approx. steam rate = 24 lbs/hr. per kw-hr.)

Turbine "C" 7500 kw (600#G inlet — automatic extraction at 160#G and 55#G condensing at 2" Hg)

The operating balance is to revolve around the division of load and process steam as follows:

Average plant load = 10,000 kw ± 750 kw

160#G process steam = 125,000# /hr ± 10,000# /hr variation.

55#G process steam = 194,000E /hr ± 20,000# /hr variation.

Also included are two pressure reducing valves (PRVs) used to back up the two extraction headers, both taking steam from the 600#G steam generator header. The PRVs are each capable of passing flows of 125,000# /hr.

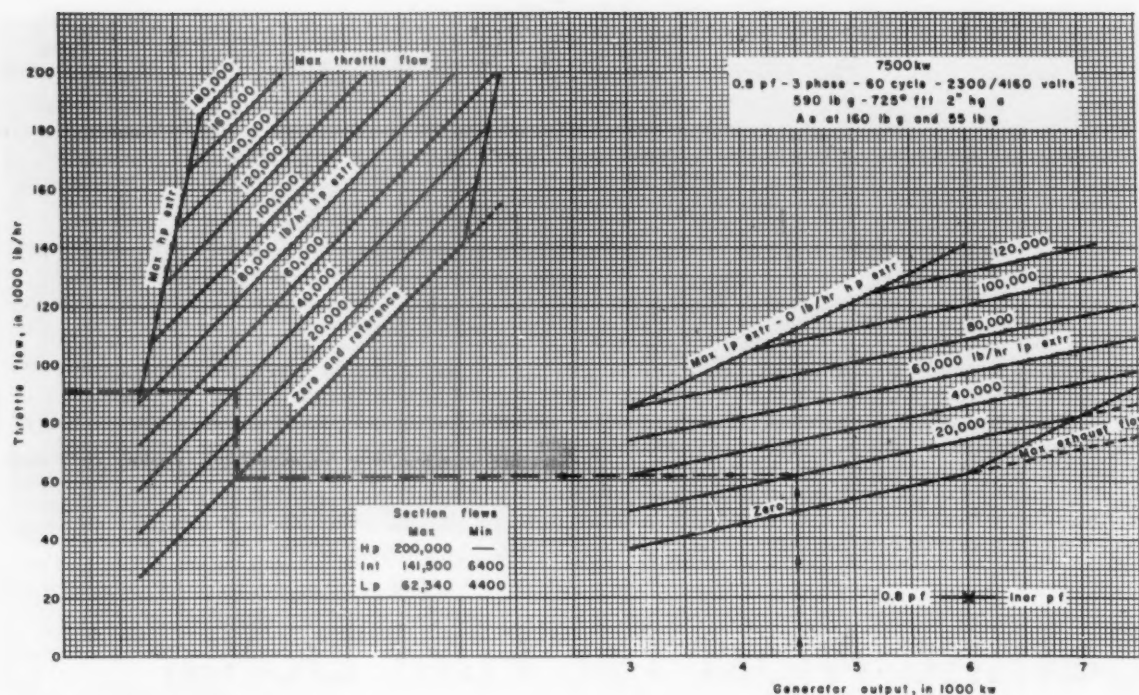


FIG. 2—PERFORMANCE CURVE

The analysis is not intended as a heat balance, but as an operating aid in achieving a reasonable power-steam flow balance for the plant. If only that part of the overall system shown on the Power Balance Diagram is considered, together with the stipulations that the system is operating isolated and that the process steam requirements are evaluated on a btu basis, it can then be concluded that the given system efficiency depends solely on the amount of condensing steam passing through turbine "C," and is entirely independent of turbine-PRV combinations that may be employed. The greater efficiency occurring when the power-process balance is met with minimum condensing steam flow. The above premise applies equally well as a result to those cases where desuperheaters are used in conjunction with PRV stations. This is clearly borne out by the fact that conditions (1) and (2) shown on the Power Balance Diagram (conditions qualified later) require the same amount of total steam generation, even though the operating combinations are quite dissimilar, due to the fact that the condensing flow in each case is exactly the same.

Condition (1) on the Power Balance Diagram refers to one possible steam flow balance which meets the established conditions with all three turbines as well as PRVs if needed in operation. Use will be made of the Performance Curve, Figure 2, issued for turbine "C" and the given turbine

"A" and "B" steam rates. The figures on the Power Balance Diagram related to conditions (1), show that the #1 PRV station is passing zero flow with all three turbines in operation. It also shows that the #2 steam generator is controlling the 600#G header (control denoted by (*) preceding the condition number), with the load and process pressure levels controlled by turbine "C." Turbine "C" would normally be operated speed compensated, while turbines "A" and "B" could be base loaded. The nature of the balance would tend to indicate that the extraction level preference limiter provided on turbine "C" should be kept out of service, favoring high pressure extraction flow over low pressure flow, should it be required by large transients.

The condition (1) balance has been set up to take a minimum amount of turbine "C" condensing flow to cover the load changes without affecting the process flow combination, while maintaining the established minimum exhaust flow in the event of a 750 KW load drop. The section flow limits are given on the Performance Curve for turbine "C," which also shows that a more than adequate allowance has been made to handle the normal flow variation without encountering control system extraction limiters. If the condensing flow of turbine "C" were increased to generate 1000 KW more than for condition (1), and the corresponding power and flow reduced on

one of the non-condensing turbines, the cost of generating the mill power would be increased about \$3.00 per hour.

How Planned Outages are Handled

Planned outages, as affecting the example system, can be handled quite readily insofar as two of the possible three turbine combinations are concerned. The third combination, where turbine "C" is to be removed from the line, cannot obviously meet the KW requirements, necessitating a cut-back in total power, and quite likely some process flow, due to the lack of sufficient power generation. One of the two remaining combinations will be used to illustrate a planned outage. This combination is illustrated as condition (2) on the Power Balance Diagram, and cover the case where turbine "A" is taken out of service. The control of steam generation, load and frequency, as well as process header pressure is the same as that exemplified for condition (1). In this case, both pressure reducing valves are in service, contributing process flow as a function of their pressure regulations, with the condenser flow of turbine "C" remaining the same as for condition (1).

A look at the steam boiler unit capabilities (both 200,000 lb/hr) indicates that a good many complications will be encountered when either is down for service. This should also be considered as a condition and, of

course, production would have to be curtailed under these circumstances.

Continuity of load frequency on an emergency basis, as seen by Figure 1, is fairly well assured, principally due to its simplicity and potential KW capability. Only in the event turbine "C" were to be knocked off the line, would any serious power shortage arise. Should this occur with turbine "A" and "B" operating on their respective speed governors, each turbine would immediately take maximum load as the frequency dropped.

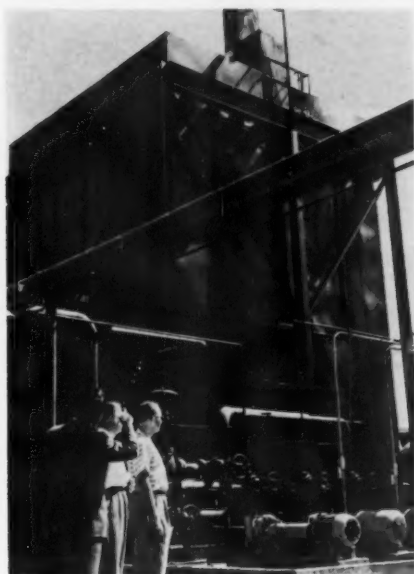
Analysis for Utility Tie-In

The same analysis can be made for the case where the plant is operating

with a utility tie-line supplying power. In this case, the flow through pressure reducing stations, as well as the condenser flow for turbine "C," should be minimized. Normally, utility power is generated mainly by condensing turbines, and costs more than power generated by process steam passing through non-condensing turbines or non-condensing sections of automatic extraction turbines.

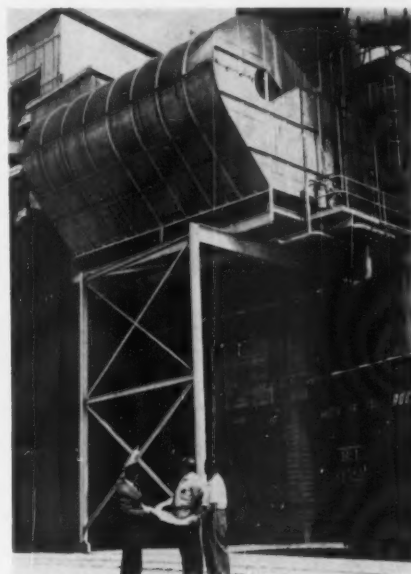
The above simplified Power-Balance System review covers only the highlights. Complex systems, having a number of turbines and process headers, with perhaps added complications, such as tie-line connections, admission and extraction flows, waste

heat boilers, critical process headers and the like, have to be treated with more detail, particularly with respect to emergencies and their effects. Reducing even a complicated system to as few components as possible, permits a quick means of arriving at combinations which will satisfy varying operating requirements. The combinations can then be evaluated in terms of dollars/day or other measure for comparison and establishing operating procedures. This approach to the problem of minimizing operating costs of steam and power generation systems can be a very effective tool and assist you in getting the most for your fuel dollar.



40-Ft. HIGH BLACK LIQUOR OXYDIZING TOWER designed by Fibreboard Paper Products Corp. engineers.

STAINLESS STEEL FLUE GAS WASHER designed and built by Buffalo Forge Co.



INSPECTING BOTH UNITS AT ANTIOCH, CALIF., MILL are Plant Mgr. T. M. Lindley (at left in both pictures), Gen. Supt. Eddie J. Cavanaugh (at right below the gas washer) and Plant Engineer R. O. Myers (at right in tower picture).

New System Controls Dust and Odor

Rust and odor control equipment valued at over \$600,000 has been installed at San Joaquin Pulp and Board Mill, Fibreboard Paper Products Corp., Antioch, Calif.

"All components are in place," President W. L. Keady reports. "There now remains the testing and refinement of new techniques and processes used for the first time."

This expenditure was in addition to \$750,000 which had already been

spent for dust and odor control at this mill in prior years.

Equipment includes a new stainless steel Type TE flue gas washer designed and manufactured by Buffalo Forge Co., with a capacity for cleaning 140,000 cu. ft. of gas per minute. To coordinate the new equipment with existing control devices, both precipitators at the mill were completely renovated.

Other major components are a

10,000 cu. ft. gas holder to absorb gases released when a digester is blown, or opened for removal of finished pulp; a 40-ft. high black liquor oxidizing tower; and a gas incinerating furnace capable of burning gases at 1500° F.

The new furnace, which rises 80 ft. skyward, is capable of oxidizing gases at temperatures high enough to render them relatively odorless, according to projected engineering specifications.

NEITHER FISH NOR FOWL. That's what Premoid's Secretary-Treasurer Raymond E. Clark (left) says about their operations. Vice President Chas F. Collins (right) is another veteran in this company. Premoid makes . . .



Imitation Leather From Woodpulp

Thirty years of know-how enable Premoid to blend pulps, synthetic latices and resins into a hybrid product.

● Premoid Corp. at West Springfield, Mass., takes domestic, Canadian and overseas woodpuls high in alpha cellulose content and blends them with latices and vinyls. The results are unlike other products produced by the paper industry. That's why Raymond E. Clark, secretary and treasurer, sometimes refers to this company as a hybrid. Premoid also makes technical papers such as automotive gaskets, abrasive backings, etc. It is a wholly-owned subsidiary of Strathmore Paper Co.

The basic process is twofold:

1. The addition of latex by means of beater addition or dry web saturating.

2. The coating of rubberized sheets with synthetic resins such as vinyl.

When Premoid acquired its 66-in. Fourdrinier about seven years ago, one executive exclaimed, "I know it won't work. It can't be done. But dog-gone, you fellows are running it."

"It wasn't always like that," recalls Vice President Charles F. (for Floyd)

Collins—another Premoid 30-year man. "We spent 30 years getting this know-how."

Pioneers of New Process

Premoid's efforts to produce imitation leathers go back to 1921 when the company tried to incorporate natural latex into a hemp or rope fiber. At that time, recounts Mr. Collins, latex was very non-uniform, unstable and hard to work with. They now use synthetic latices because of uniformity.

Premoid believes it is one of the earliest companies to develop methods of impregnating fibers with natural and synthetic latices for commercial use. A big problem for many manufacturers today, as in the early years, is to fuse vinyl and not have the paper deteriorate then or subsequently.

"We were pioneers in this," says Mr. Clark, "but it took a lot of learning to be able to operate in temperatures between 450°F and 500°F. Even today, few people can do it."

A big impact upon their work was the development of vinyl coatings on a latex impregnated base. "We were one of the first to do this, in 1947," says Mr. Collins.

The 66-in. Fourdrinier has a tremendous range, from 60 lbs. (24 x 36 basis) to 500 lb. While its production in tons (10 to 15 tpd) does not sound impressive, it nevertheless is the start of a high-priced specialty product.

Description of Process

After the base stock has been formed and dried on the paper machine, it is then processed in separate off-the-machine operations. Here, the dry sheet is immersed in a latex bath. After drying, this latex saturated sheet is then coated on one of two reverse roll coaters which have a maximum width of 55 in. From the coater the sheet is threaded through a drying oven with ascending temperatures. Here, the final delicate job of fusing the vinyl film takes place. The initial temperature is about 250°F. and the

temperature is gradually brought up to a top of around 500°.

A most important phase of coating Premoid is done in the color preparation department. To give an idea of the amount of work done, there are two 3500 gal. capacity tanks, four 350 gal tanks, plus a host of smaller size mixing tanks. Every order is tailor-made; no finished goods are made for stock.

End Products

The leather-like products from Premoid, in numerous grains are used by the automotive industry for body trim material; in shoes, novelties such as wallets, children's toys, handbags, luggage, garment and millinery, box covers and gaskets.

Sales are to three areas:

1. Saturating papers to mills who dry web saturate or impregnate.
2. Impregnated or saturated papers to coaters for converting in their plants.
3. Vinyl or resinous coated products varying from plain to high metallic finishes.

Sales are world-wide through jobbers and exporters.

In order to maintain the Premoid quality, a continuous quality control department works around the clock every operating day.

All new products have come via research and development in the Premoid laboratories. In many cases Premoid has worked with national manufacturers to develop products meeting their own specifications.

Three years ago Premoid added a new building with some 32,000 square feet to give them a total of 120,000 square feet. Today, it has outgrown that space and another building has now reached the blue print stage.

Concludes Mr. Clark, "Nothing in this business remains constant, progress continues—taking new fibers and chemical compounds and molding them into new products."

(Top)

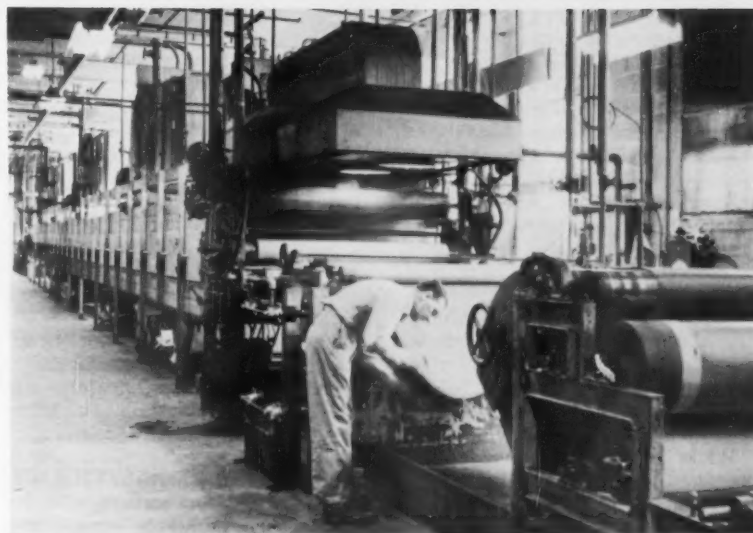
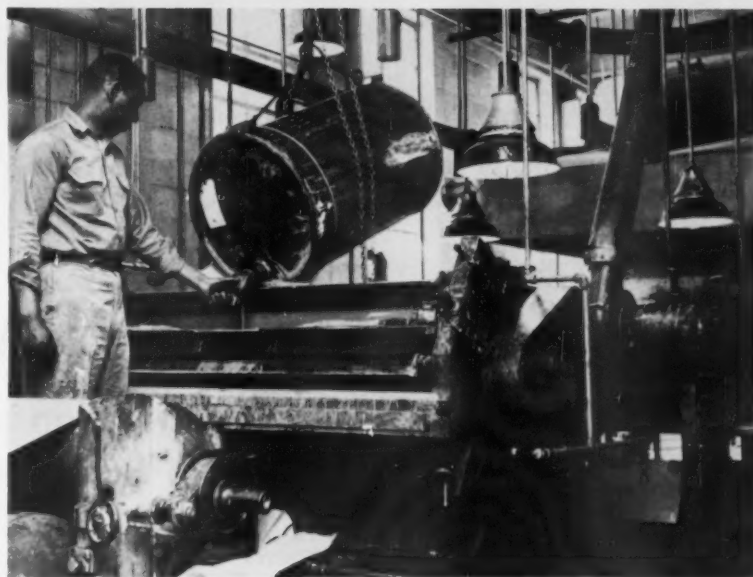
COLOR PREPARATION is important phase of coating Premoid. Every order is tailor-made, as shown by color batch being prepared in this picture.

(Middle)

REVERSE ROLL COATER applies resinous material to latex impregnated sheet. Then . . .

(Bottom)

FINAL DELICATE JOB of fusing vinyl film to sheet takes place in drying oven with ascending temperatures. Initial temperature is about 250°F and is gradually brought up to around 500°.





MAKING PAPERBOARD AT BURNABY, B.C. . . . At left, wet end of Sidney's new No. 4 machine. At right, stuff boxes built by company's own staff.

New Systems for New Machine

A 120-inch cylinder operation is key unit as Canadian company moves itself across a sea to reduce costs

● It isn't often that a long-established pulp and paperboard company decides to pull up stakes and transplant its entire operation to another location more than 50 sea miles away; yet that is precisely what Sidney Roofing & Paper Co. is now doing in British Columbia at a cost of about \$7,000,000.

Sidney Roofing & Paper Co. is owned by Garfield Weston, multimillionaire "biscuit king" who has large interests in the United Kingdom and the U.S. as well as in Canada, where he owns the E. B. Eddy Co. mills of Hull, Que.

Nearly 40 years ago, the Sidney company was established in Victoria, capital of the province, by Robert W. Mayhew, later to become a federal cabinet minister and Canadian ambassador to Japan.

While the company has always prospered, it was found that as the operation grew the cost of maintaining it in Victoria was becoming ex-

sive. Transporting raw materials from the mainland to the mill on Vancouver Island and shipping the finished product back to mainland markets was adding over \$500,000 annually to the cost of doing business.

A couple of years ago it was decided to shift the plant across the Gulf of Georgia, and establish a new and bigger operation on a 75-acre site in Burnaby, on the Fraser River, about ten miles east of Vancouver.

Sandwell & Co., Vancouver consulting engineers, directed the project. The contracting firm is John Laing & Sons.

The Victoria plant continues to operate but is gradually tapering off as the new unit in Burnaby swings into steadily rising production. The transfer will be completed by the spring of 1959.

Meanwhile the Burnaby plant is in every sense a going concern, with the key unit in the whole enterprise—a

new 120 ft. long Black-Clawson paper machine—and most of its associated equipment in full running order. This is Sidney's No. 4 machine—1, 2 and 3 are still at Victoria.

Pushbutton Stock Preparation . . .

The Burnaby plant incorporates many new ideas in design and processing. The stock preparation system is a notable example of automation. Movement of materials to the pulpers and of stock into the Hydracycles and other processing units and finally to the machine is controlled at the panel board.

Addition of a stock to a Hydracycle tank, for instance, entails two simple procedures on the Foxboro panel—adjustment of the set point loader and pushing of a button adjacent to the required stock on a Seam annunciator. The annunciator window associated with the operated pushbutton is illuminated by a flashing light throughout

duration of that particular stock addition. When the required volume of the selected stock has been added to the tank, the stock valve automatically closes and the annunciator window is illuminated by a continuous bright light for the remainder of the batch.

Thus, when the annunciator stops flashing and remains bright, the operator knows the tank is ready for other operations. The bright light "remembers" for the operator, so he knows what stocks he has added and the chance of omission or double addition is minimized.

Raw materials range from waste paper to bleached chemical wood-pulps, and they are delivered to the unloading deck outside the stock preparation building by truck, rail or barge. Three incline bale conveyors—more will be added—built by Letson & Burpee with Link-Belt chain and equipment deliver to three batch pulpers and two continuous pulpers.

The stock is pumped from the pulpers to a series of Shartle five-way Hydracycles, motor operated with rotary valves. From Hydracycle tanks the stock is pumped to machine chests, then discharged through ten DeZurik consistency regulators—one to each chest, through E. D. Jones refiners or a Jones jordan, depending on the operating plan in effect.

Four DeZurik units regulate consistency of the waste paper system, three take care of the batch system, one, the broke pulper, one, the broke storage operation, and one, the liner system. Most Jones refiners are the Fibremaster model, driven by 200 hp motors at 720 rpm. All refiners and the jordan have Accru-Set control mechanisms.

A Black-Clawson broke pulper processes trim and other waste.

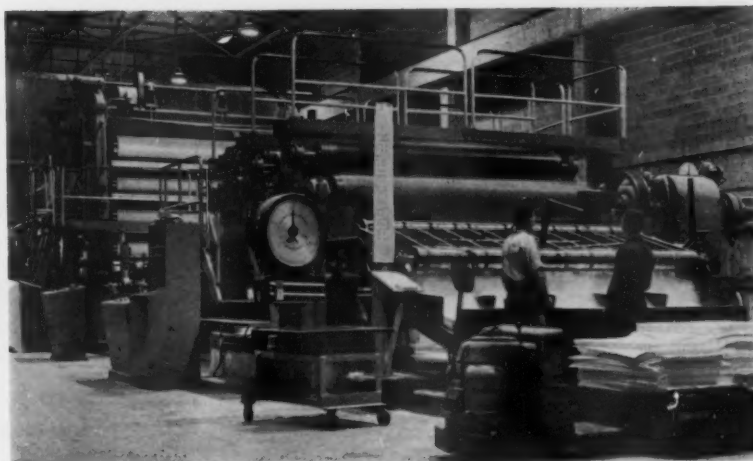
The pulp stock is thinned, after the continuous pulping operation, cleaned and thickened for storage in four horizontal Stebbins-lined concrete chests, for four different types of stock, each of one-ton capacity capable of diluting to 3%.

Description of New Machine . . .

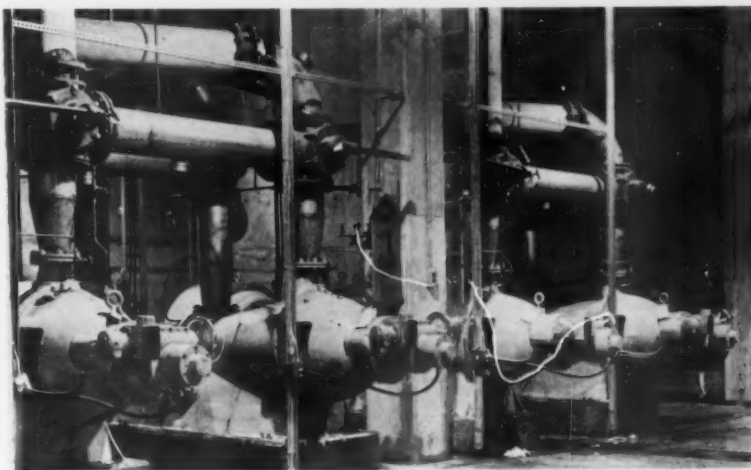
No. 4 cylinder machine, 120 in. trim, operates at 350 fpm, and has six vats, each with a 42 in. diameter cylinder. It is driven by steam turbine.

Press section includes a suction drum roll, three primary presses and three main presses. All main presses have crownless rolls, providing more uniform pressing across full width of the sheet.

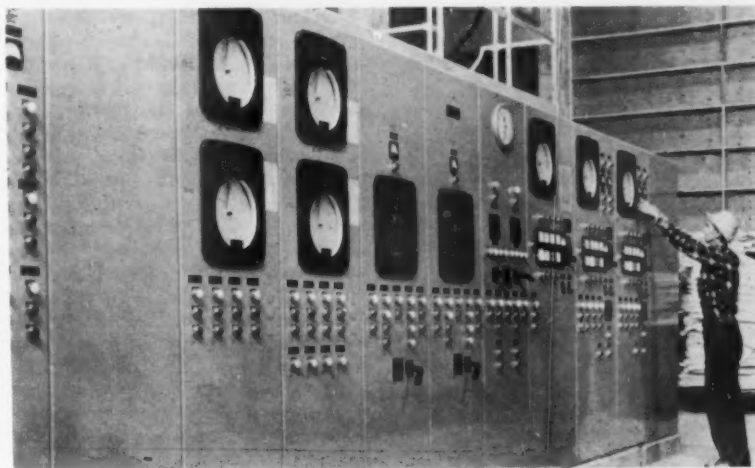
Dryer section contains 42 five ft. diameter dryers in the initial installation, arranged in such a way that 36 additional dryers may be installed as required. Dryer section is fitted with a



DRY END OF NO. 4. Two nine-roll calender stacks followed by Black-Clawson Duplex cutter with Fairbanks Morse scale at left.



PART OF REFINING SYSTEM are these E. D. Jones & Sons Fibremasters with Accru-Set controls.



STOCK PREPARATION IS BY PUSHBUTTON . . . thanks to these Foxboro controls and Seam annunciator windows, below operator's hand, which illuminate to show stock movement.

Flakt hood and air system provided by S. F. Products, Ltd.

Next are two calender stacks, each of nine-roll capacity. The calendered sheet goes either to a Black-Clawson Duplex cutter or drum-type reel capable of handling 72-in. diameter finished rolls. The Duplex cutter is operated on rectangular sheets of finished product according to customer orders. Sheets from the cutter are stacked on skids, then wrapped and banded for shipment.

The Dilts TD12 winder is a two-drum unit equipped for making rolls up to 72 in. diameter.

A Dorr-Oliver disc-type saveall recovers fibers. Pumps are mostly Bingham and Goulds. Reduction gears are by Canadian Sumner Iron Works.

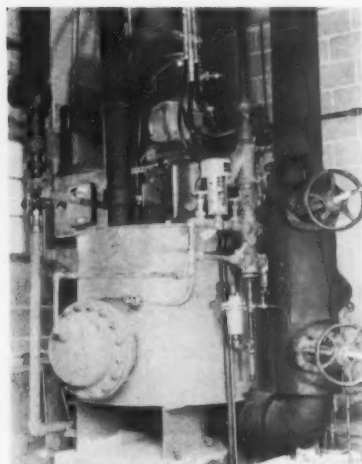
Chemicals . . .

Alum and size in liquid form are stored in heated tanks outside the main buildings. A Hercules emulsifier is operated in connection with the size system. Alum is delivered by tank cars unloaded by air pressure. The liquid alum is heated, pumped into an unheated running tank in the stock preparation building and from there into a small headbox that feeds through an individual line to consistency regulated headboxes.

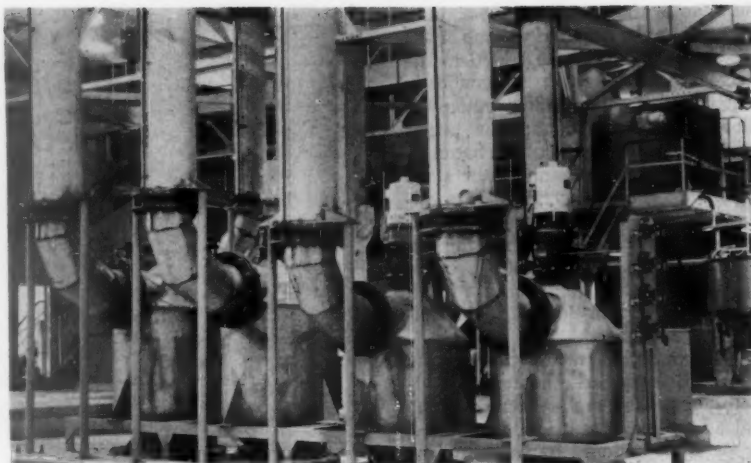
In addition, alum and size are pumped from the stock preparation building through circulating lines by pre-setting of controls on the panel so that a predetermined amount can be discharged through Niagara-type meters to the Hydracycle tanks.

Water Supply and Disposal . . .

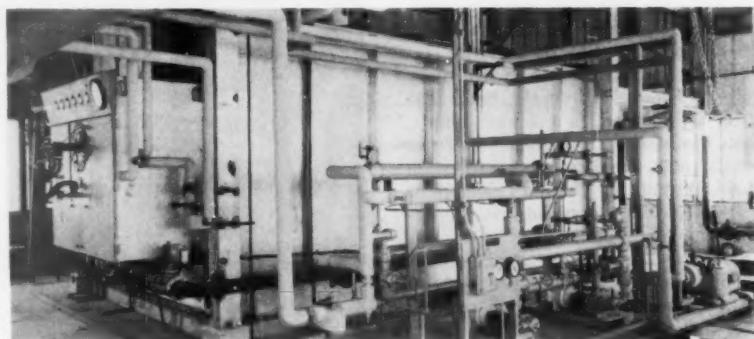
One of the problems encountered in planning the Burnaby plant was to



FOR SIZE TREATMENT . . . this Hercules emulsifier.



FOUR REGULATORS FOR WASTE PAPER STOCK. There are six other DeZurik consistency regulators for other systems.



FOR POWER . . . this Foster-Wheeler package unit produces 40,000 pph steam. One of first in region to burn natural gas.

provide for satisfactory water from the muddy Fraser. Seven million gallons of water will be required daily—enough to meet the normal requirements of a city of 35,000. A Northwest Filter Co. treatment system purifies the river water at the rate of 3500 gpm. A settling pond receives the river water through screens and it is treated with alum and chlorine.

Effluent poured back into the river at the rate of 1,000,000 gpm, is blended with the Fraser River's waters via a 30 in. diameter pipe which takes the waste water 100 ft. from the bank into the center of the river, and an extension which turns sharply downstream to a point 14 ft. below low tide level. Then the effluent is sprayed through minute jet holes under pressure at the rate of seven feet per second.

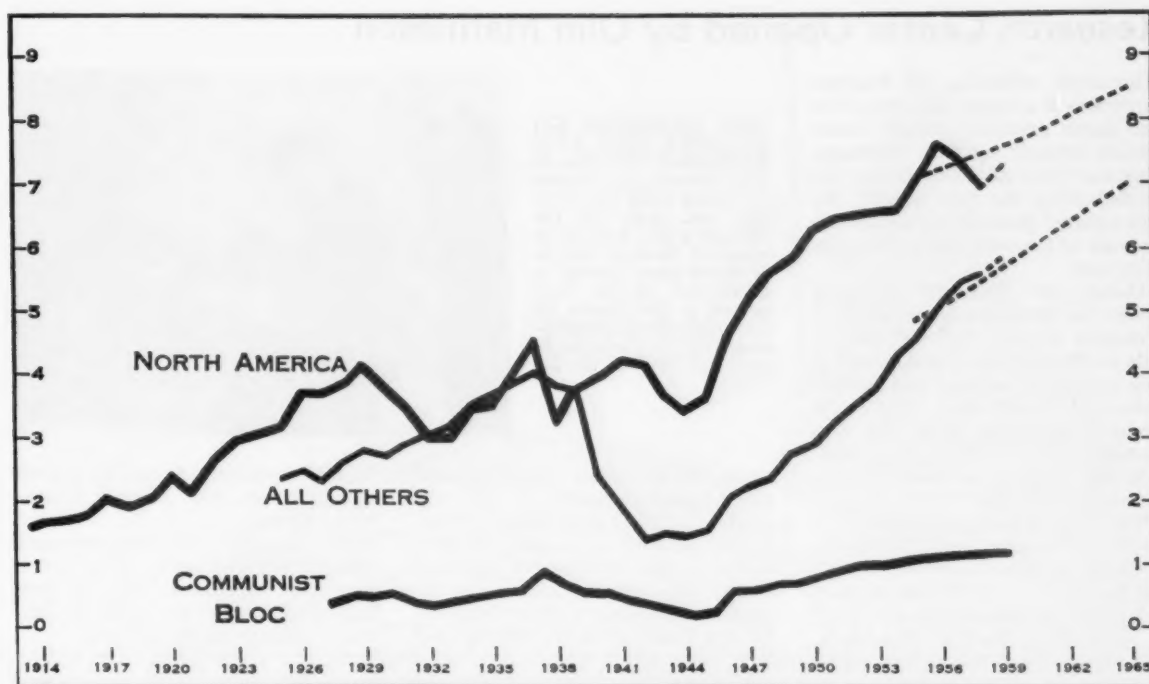
The Fraser is one of the world's greatest commercial salmon rivers, and the plant's water system required fuel oil. The plant is one of the first

provincial agencies.

The steps taken at Burnaby to disperse the water are for the purpose of hastening its mixture with the main flow, even though the effluent is relatively harmless.

Most plant buildings were erected on sand fill pumped from the river six to eight feet deep by B. C. Bridge & Dredging Co. The main building is on pressure-treated creosoted piles. The buildings are of reinforced concrete, with concrete blocks providing permanent walls and temporary walls of timber frame. Roofs and decks of the stock preparation building and machine room are of yellow cedar and insulated.

The plant is served by a Foster Wheeler package power unit operating at 400 lbs. pressure and producing 40,000 lbs. of steam per hour. The boiler can be fired by natural gas or sanction of international, federal and in the area making extensive use of natural gas piped from Alberta. ●



WORLD'S TOTAL APPARENT NEWSPRINT SUPPLY NORTH AMERICA, COMMUNIST COUNTRIES, OTHERS
(In Millions of Short Tons of 2,000 lbs.)

World Needs More Newsprint

Increased output in Continental Europe meets 60% of demand. Canada and Scandinavia are still major suppliers to many nations.

The world will need more newsprint in 1959 than ever before, according to an estimate recently completed by the Newsprint Association of Canada in Montreal. Demand will exceed 14,200,000 tons for the first time, if the forecast proves accurate.

The association's review of the industry points out that world supply in 1958 declined for the first time since the war, although the drop was less than 2.5% and was due largely to a reduced demand by newspapers published in North America which use more than half the world's output. Newsprint consumed by North American publishers in 1958 was about 6% less than in 1957 and about 9% less than in 1956, a decline following two years in which North American supply rose 16% from its 1954 level.

Newsprint consumption in North America in 1959 is estimated at 7,300,000 tons, the same as in the peak year of 1956. Publishers' purchases, however, may be less than in 1956 by some 225,000 tons, which they added to stocks during that year.

Summarizing the world newsprint situation, the association declares:

"The trend in world supply, exclusive of North America and the Communist countries, was also interrupted in 1958. Estimated supply of all these countries is only 1% greater than in 1957 in contrast to the average annual increase of 9% in the 1949-57 period. Estimated demand by these countries for 1959 is 5% greater than 1958, a partial return to normal.

"In contrast to the decrease in world shipments in 1958, newsprint capacity increased substantially. As a consequence, nations outside Communist countries have reserve capacity of about 2½ million tons. This reserve is fairly evenly distributed among the large newsprint producers of Canada, the United States and Scandinavia.

"Canadian shipments of newsprint in 1959 will total 6,140,000 tons as compared with 6,000,000 tons in 1958. However, the 1959 estimate may be conservative. Estimated Canadian shipments for 1958 are, 4.8 million

tons to the United States, 420,000 to Canadian newspapers, 780,000 tons overseas.

"The pattern of world trade in newsprint has changed during the last five years. One of the most significant developments is the creation of a large newsprint industry in Alabama, Arkansas, Tennessee, and Texas in Southern U.S.A. In 1959 total United States newsprint capacity will be about equally divided between these states and the older northern U.S.A. mills in Maine, New York, Oregon and Washington. Another development has been the advent of newsprint production in New Zealand and Chile.

Despite this, the world still depends upon the newsprint exporters, Canada and Scandinavia. In Europe, increase in production since 1950 has met only 60% of increased demand. Excluding North America, Europe, and self-sufficient Japan, other nations have met less than half of increased needs by increased production."

Research Center Opened by Olin Mathieson

Increased utilization of Southern hardwoods is a major objective of the new forest products research center opened recently by Olin Mathieson Chemical Corp. at West Monroe, La. In dedicating the new facility, the firm reported plans for an accelerated program of research and product development.

Called the Frostkraft Research Center, the laboratory is part of Olin's packaging div. Its staff will concentrate its efforts on the development of new packaging products and the improvement of old ones. (The forest products operations cover the production and sale of kraft paper products, pine lumber, hardwood flooring and treated lumber.

The center is under the direction of Dr. David C. Lea, research and development manager. Assisting him are Dr. Paul Gilmont, in charge of pulp and paper; Lawrence Shipman, head of packaging; Russell Jagoditsch,

OLIN MATHIESON EXECUTIVES TOUR NEW RESEARCH CENTER at West Monroe, La. **ROBERT H. EVANS** (left) vice pres. and gen. mgr. of the Packaging div., looks on as president **STANLEY DE J. OSBORNE** peers through a microscope. In the foreground is **DR. DAVID C. LEA**, research and development mgr. for forest products and head of the facility.

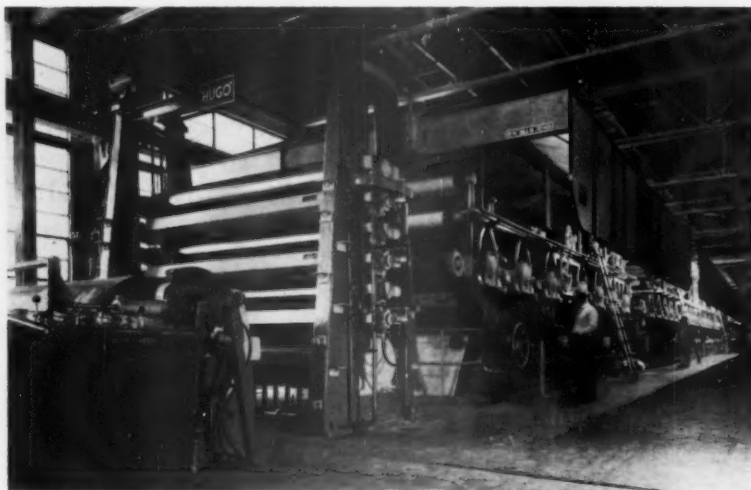


supervisor of coating operations, and Craig Campbell, lumber research.

The 12,000-sq. ft. building houses a pilot plant for papermaking, laboratories, testing facilities, a technical library and offices. Included are an experimental paper machine designed by the Frostkraft staff; pulping and

bleaching equipment, and an experimental coater. The package laboratories contain an inclined impact tester, vibration tester, drop tester and other testing equipment that simulates actual use conditions. There are two controlled weather rooms for evaluation under various conditions.

"Hugo" Shifts into Production



NAMED "HUGO," a machine that set records. Built by Black-Clawson. The hood shown here and air system is by J. O. Ross Engineering Corp.

• The handsome paper machine shown above is christened "Hugo" in honor of Hugo H. Hanson, chairman of the board, Hamilton Paper Co., Miquon, Pa. Now in production, "Hugo" is a 126-in. wide Black-Clawson fine paper machine designed for speeds from 400 to 1,200 fpm., producing 80 to 100 tpd of bond and offset papers, gives Hamilton a 30% production increase on one machine.

According to officials of Hamilton, delivery and erection of this machine set at least two records for fine paper

machines: By special arrangement it was possible to deliver every component of the machine by truck from Watertown, N.Y. to Miquon. A machine erection speed record of 55 days from laying of sole plates to completion was also set.

Machine Features:

Headbox: stainless steel open type and slice.

Fourdrinier wire: 126-in. wide by 85-ft. long.

Press section: First press is bottom

suction roll with top granite roll.

Second press has bottom rubber covered roll with top bronze shell. Third press is a smoothing press with bottom roll bronze and top roll rubber covered.

Dryers: 53 paper dryers and 8 felt dryers.

Size press: between second and third dryer sections.



William Taylor Webster Retires, but Plans Activity

... although retiring, "Bill" Webster is planning to remain active in this industry. Before its acquisition by Owens-Illinois, Mr. Webster was vice president and a director of National Container Corp., and was general manager of all National Container mills. He has long been a leader in the Fourdrinier Kraft Institute and other industry management and research activities. In earlier years he was in charge of operations of the kraft pulp mill in Tacoma, Wash., now part of the St. Regis organization. His residence is 4215 Great Oaks Lane, Jacksonville 7, Fla. He will be at "Paper Week" in New York, as usual, in late February staying at the Commodore Hotel.

Here's the fast way for you to use
NATIONAL ANILINE'S
COLOR-MATCHING SERVICE!

NATIONAL ANILINE COLOR MATCHING SERVICE
 To assist us in matching your dyeshades, please fill in the following information: _____ Date _____

1. Stock Composition
 Brightness of each stock _____
2. Size _____ % Alum _____ %
3. Approximate White Water pH _____ %
4. Types of Fillers _____ %
5. Type of Starch _____ %
6. Silicate of Soda _____ %
7. Other Chemicals _____ %
 Type _____
 Type _____

10. Note: The sample sent should be large enough to allow drying and other tests which may be necessary to make the color match. Please include full instructions for matching.

National Aniline makes it easy to get fast, accurate service on paper-color matches.

Simply dispatch this self-mailing form to the nearest National Aniline office. Formulations based on your fastness and processing requirements will be promptly returned . . . using the most economical combination of dependable National® Paper Dyes.

This is just one more "extra" service that makes it pay to call National Aniline first.

If you do not have a supply of these handy-to-use match-request forms, call us today.

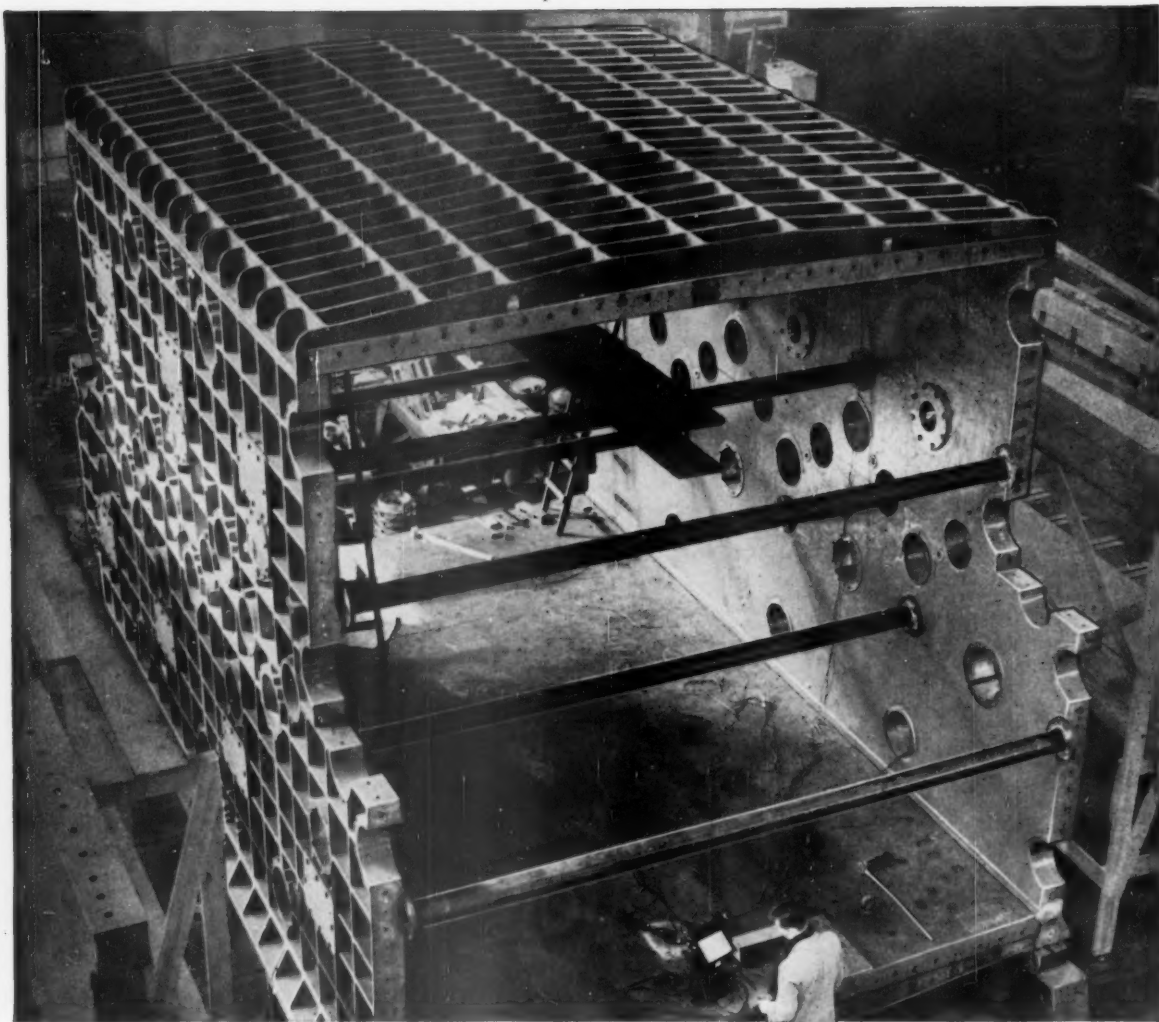
P.S. We'll do our best to use dyes we know you have "on hand".



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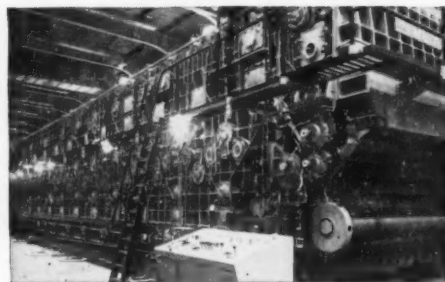


The Pulp Drying Machine

at Hinton, Alberta, is a

DOMINION

The strain gauge test, here being performed on a section of the vacuum chamber for the Dominion Vacuum Drying Pulp Machine, is typical of the modern methods employed by Dominion Engineering to ensure that its products maintain the high standard of performance established over the Company's many years of service to the Pulp and Paper Industry.



PAPER DIVISION

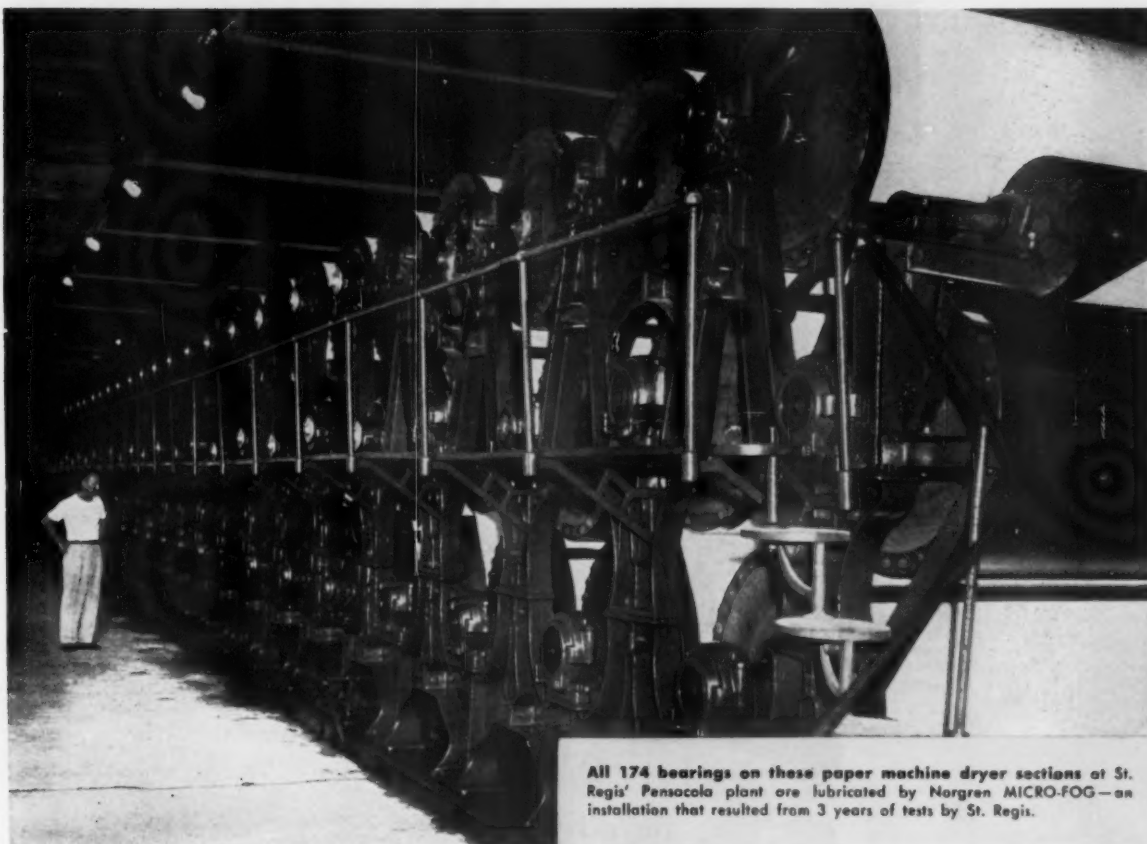
DOMINION ENGINEERING
COMPANY LIMITED

MONTREAL

TORONTO

WINNIPEG

VANCOUVER



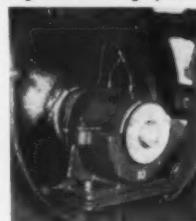
All 174 bearings on these paper machine dryer sections at St. Regis' Pensacola plant are lubricated by Norgren MICRO-FOG—an installation that resulted from 3 years of tests by St. Regis.

ST. REGIS PAPER CO. TESTS PROVE NORGREN MICRO-FOG LUBRICATION BEST



Results of three years of testing by St. Regis prove Norgren MICRO-FOG Lubrication on paper machine dryer sections best in every way...

1. Thoroughness of MICRO-FOG Lubrication is far superior—Delivery of oil is consistent throughout bearing system.
2. Maintenance of lubrication system greatly simplified—Eliminated periodic installation of grease blocks and hand oiling.
3. Bearing temperatures reduced—Heat reduction averaged 8° to 10° F.
4. Less lubricant is consumed—Ended frequent oil changes previously necessary due to discoloration and plastic-like formation.
5. Eliminated paper losses formerly caused by excessive lubrication.
6. Simple to install, easy to operate compared to circulating system.
7. Lint and other contaminants are excluded from bearings — MICRO-FOG system maintains positive pressure in bearing housings.



How MICRO-FOG distribution line enters a plain bearing.

MICRO-FOG
by **NORGREN**

For complete information about this application, call your nearby Norgren Representative listed in your telephone directory—or WRITE FOR BLUEPRINT MF-23-A

C. A. NORGREN CO.

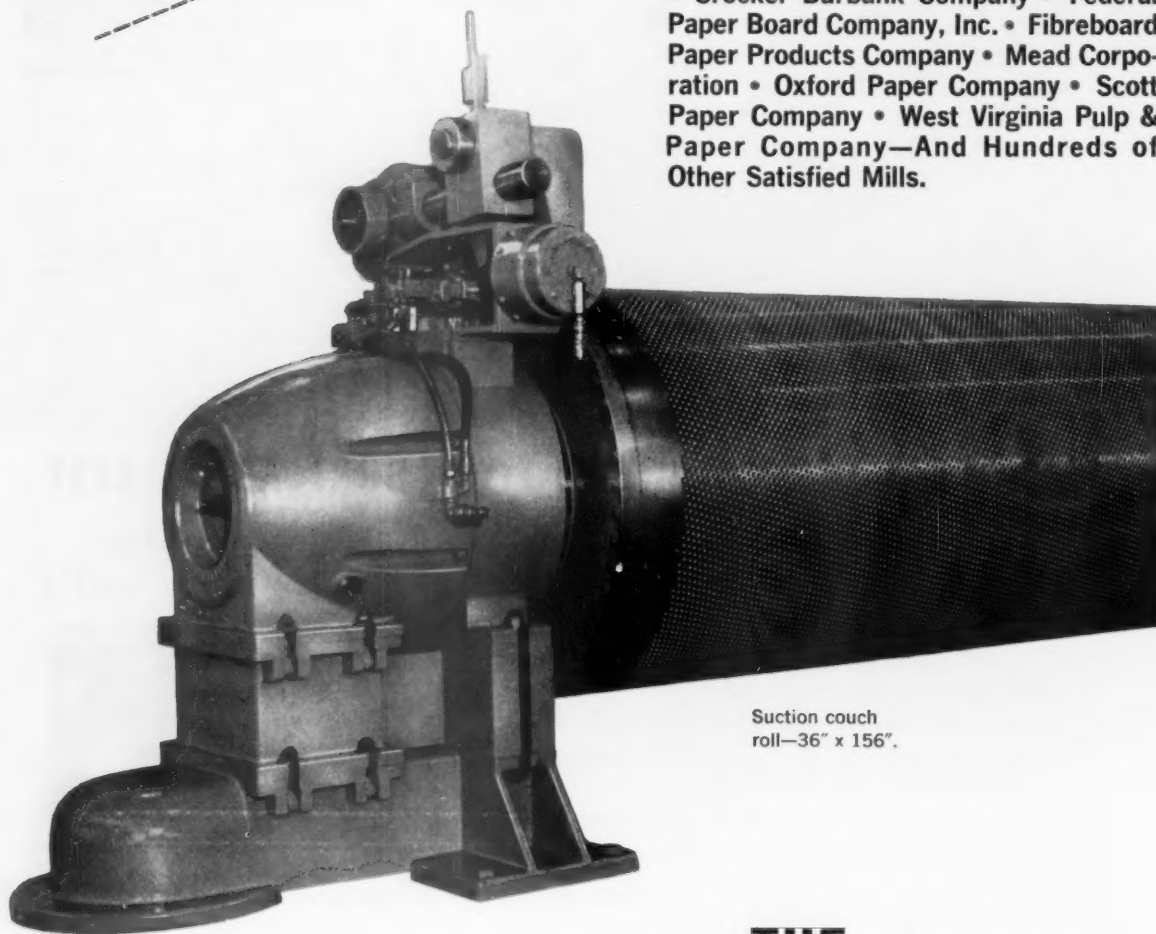
3458 SOUTH ELATI STREET, ENGLEWOOD, COLORADO



Make MANCHESTER Your Headquarters for Suction Rolls

Look at these REPEAT USERS!

American Writing Paper Company • Armstrong Cork Company • Celotex Corporation • Champion Paper & Fibre Company • Container Corporation of America • Crocker Burbank Company • Federal Paper Board Company, Inc. • Fibreboard Paper Products Company • Mead Corporation • Oxford Paper Company • Scott Paper Company • West Virginia Pulp & Paper Company—And Hundreds of Other Satisfied Mills.



Suction couch
roll—36" x 156".

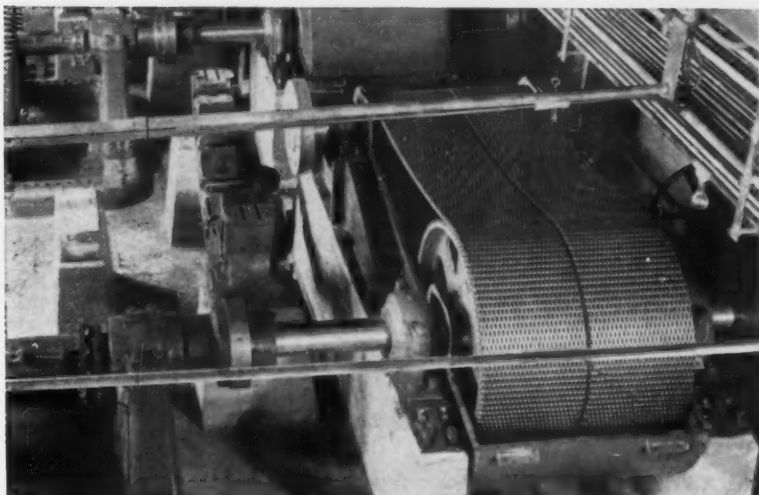
Specialists in designing and Building Paper Mill Machinery

THE
Manchester
MACHINE COMPANY

MIDDLETOWN, OHIO

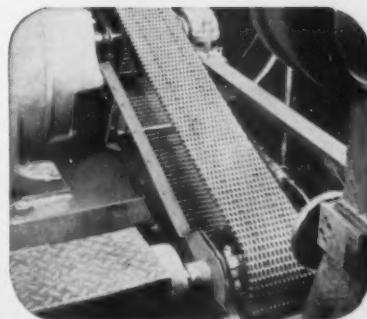
How LINK-BELT silent chain comes through
industry's stiffest tests

No other drive can do the same

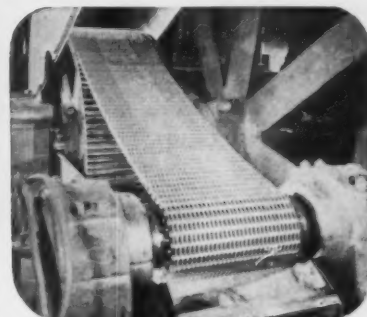


LARGE OR SMALL HP. Two 24-in. strands of Link-Belt silent chain on turbines powering 850-kw generators comprise one of

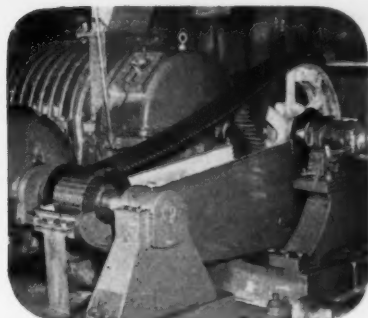
the largest chain drives ever built. Silent chain provides high efficiency (over 98%) on large or fractional hp drives.



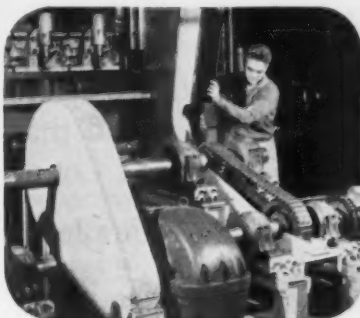
HIGH SPEED. Link-Belt silent chain drives on newspaper presses often operate at speeds of 4000 to 5000 feet per minute.



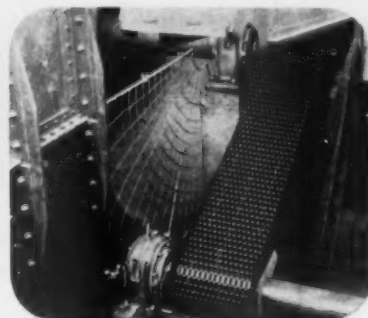
ADVERSE OPERATING CONDITIONS. Effects of heat, humidity and cold are minimized with Link-Belt silent chain drives.



LARGE RATIOS. Link-Belt silent chain operates efficiently at ratios as high as 10-to-1, with resulting space economies.



LIMITED SPACE. Easy to assemble in close quarters, Link-Belt silent chain permits built-in drives, compact housings.



LONG LIFE. Link-Belt silent chain has given more than 30 years of uninterrupted service on ventilating systems.

Ask your Link-Belt office or authorized stock-carrying distributor for

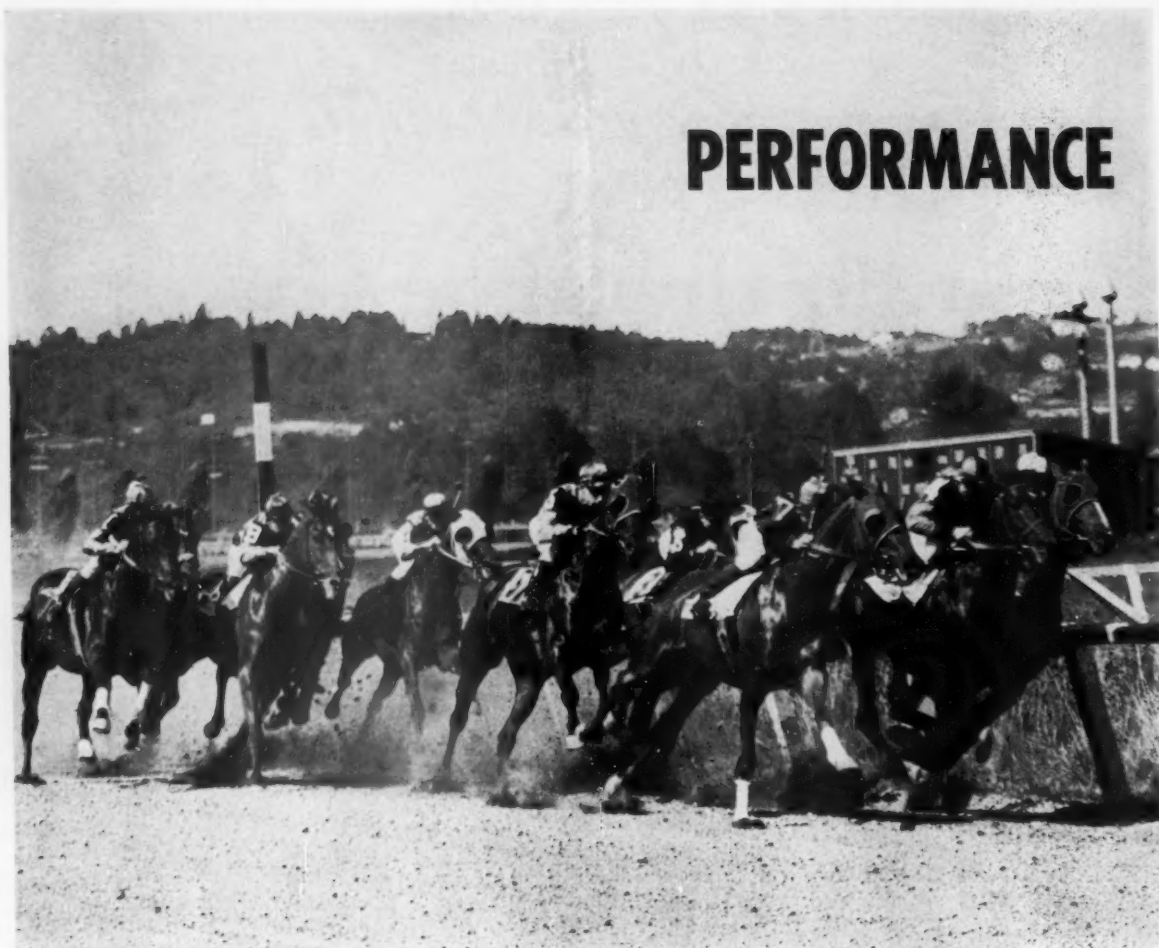
LINK-BELT

SILVERSTREAK SILENT CHAIN DRIVES



88-page Book 2425

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Mar-rickville, N.S.W.; South Africa, Springs. Repre-sentatives Throughout the World. 14,680



In the backstretch it's performance that counts. When a horse, rider and trainer work together to win the purse, that's performance. When a valve is engineered to give you non-clogging pulp service, that's performance...and that's a Fabri-Valve ...Performance That Counts.

For a catalog showing the complete line of fine quality Fabri-Valves engineered to help you save time, effort and money, simply mail the coupon below.



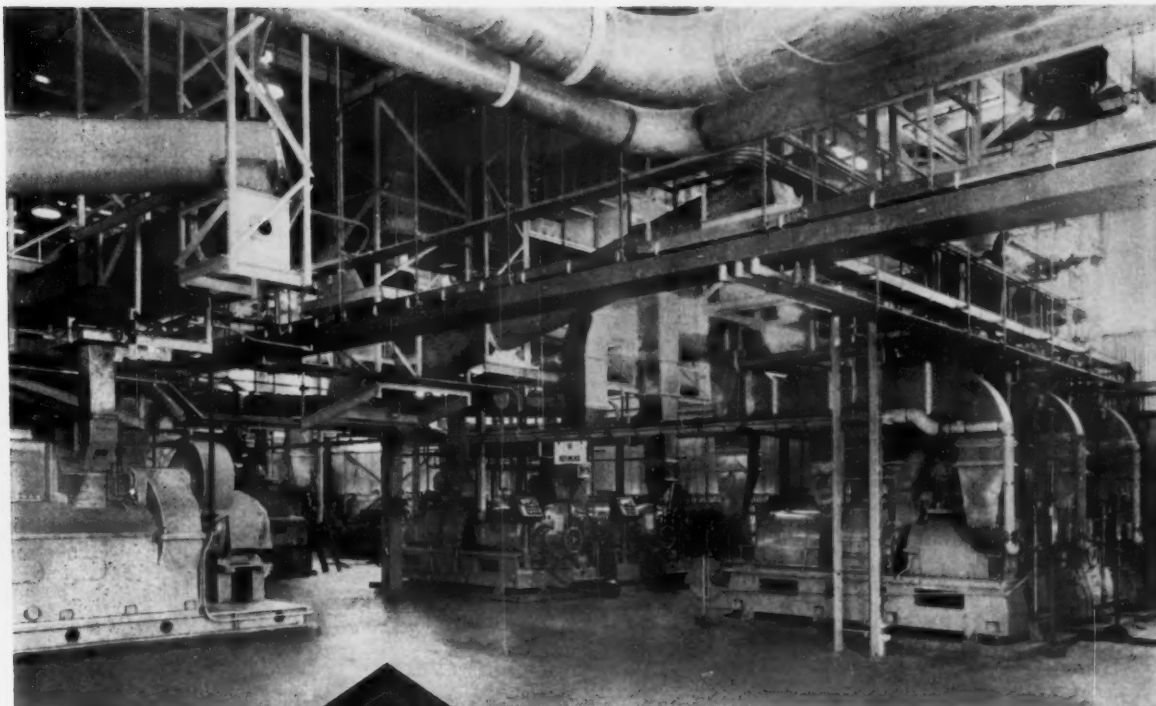
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ANOTHER

Bauerite

INSTALLATION

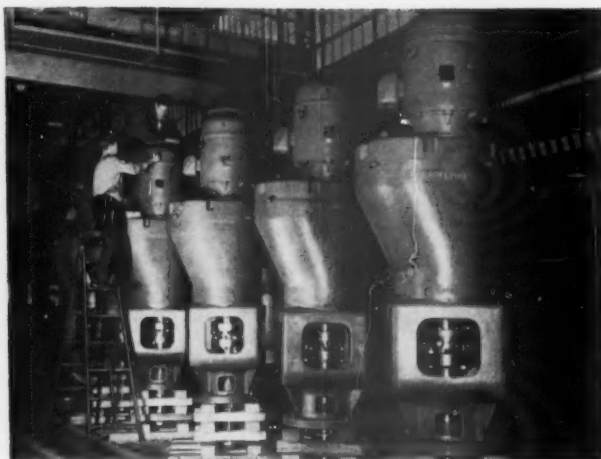
Bauer double revolving disc refiners and Pressafiners, a portion of the Bauerite equipment installed at Diamond Gardner's pulp mill in Red Bluff.

High wood utilization keynotes the ultra new Diamond Gardner Plant at Red Bluff, California. The integrated pulp mill produces molding pulp with the Bauerite Process of making groundwood pulp from chips.

One of the advantages of this process is its ability to utilize locally available raw materials. This includes residue from wood processing operations, as well as species of wood suitable for conventional grinding and many species formerly considered unsuitable.

The Bauerite Process opens new horizons in two ways. It can breathe new life into mills faced with a dwindling supply of regularly used raw materials. On the other hand, it also permits location in new areas, closer to markets being served. May we send you more information?

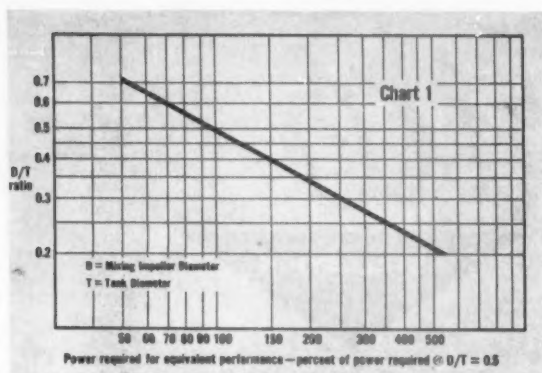
 The Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio



Q. In larger mixing operations, what are the economics of buying mixers that match requirements exactly compared to buying mixers having an adequate margin of torque capacity?

A. As mixing operations are scaled up and fluid mixers required increase in size, the cost per unit drive torque capacity decreases rapidly with the increase in drive size. It becomes poor economy not to maintain an adequate level of torque applied to the mixing operation. Consider also that agitators and auxiliaries rarely represent more than a small percentage (2-4%) of the plant investment . . . yet maintenance costs on the more difficult operations can run as high as 15% or 20%. If down time is considered, then costs can run many times these figures. Obviously, there is no economy in drives and components such as shafts which just meet requirements.

it's questions like these . . . that bring out the facts in buying mixers . . .



Q. Are "dollars per horsepower" a valid basis for comparing mixer values?

A. No. Mixers having the same horsepower rating and drive efficiency can vary widely in torque rating. Torque applied to the mix is what does the work and torque is what you pay for. When comparing mixer values, the most important first step is that of developing torque ratings of alternate units offered. Using the most familiar units, torque can be calculated as follows:

$$\text{Torque (lb. inches)} = \frac{63025 \times \text{Motor HP}}{\text{Mixer shaft RPM}}$$

The mixer having the lower torque rating must use a higher mixer shaft speed and smaller diameter impeller to maintain a given HP level. This can lead to unsatisfactory performance. However, a mixer of equivalent horsepower rating but with a higher torque rating and larger impeller will do the job well. For an idea of the importance of impeller size, the chart shows the influence of impeller diameter in relation to tank diameter (D/T ratio) upon motor required to obtain a specific level of performance in many industrial mixing operations. The bigger impeller at the slower speed (higher applied torque) will be a sounder choice.

YOU GET MORE FOR YOUR FLUID MIXER DOLLAR Because We Design and Build The Whole Unit

It's simple economics! Philadelphia Mixer is the only manufacturer that designs and builds the complete unit. Because we control production and costs, we can afford to give you more mixer per dollar. For example:

- Extra large, heavy duty bearings throughout.
- Extremely heavy output shafting—machined, ground and polished.
- Drives designed with extra strength and rigidity to take maximum thrust and unbalanced loads.

You don't pay a premium for these extras—or for the better performance and longer life of a Philadelphia Mixer. You get them as a bonus.

You can select your Philadelphia Mixer from six standard models. 1 to 200 HP. Special units to 500 HP. Horizontal motor or vertical motor drive. Mechanical seal or packed stuffing box. Paddle or turbine type impellers.

Get the full story on Philadelphia Mixers. Write for Catalog A-27. It contains complete mechanical design information that permits you to make a catalog selection of the mixer that best suits your requirements.

PHILADELPHIA GEAR CORPORATION
Erie Avenue and G Street • Philadelphia 34, Pennsylvania

philadelphia mixers

Offices in all Principal Cities
INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE
VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS



TIME ON HER HANDS

... to work for you!

In the Paper Section of SOLVAY Technical Service this young lady devotes all her time to the problems of papermen like yourself. Working with a SOLVAY field staff of industry-experienced paper experts, she's ready to give individual help to SOLVAY customers on specific matters—ranging from sample analysis to new process development. Her "office" is the nation's largest alkali laboratories.

If you would like information or technical aid in applying any of the SOLVAY® products listed here, write us. We invite you—at no obligation—to sample this rich 78-year tradition of SOLVAY quality and skill.

SOLVAY CHEMICALS FOR THE PAPER INDUSTRY:

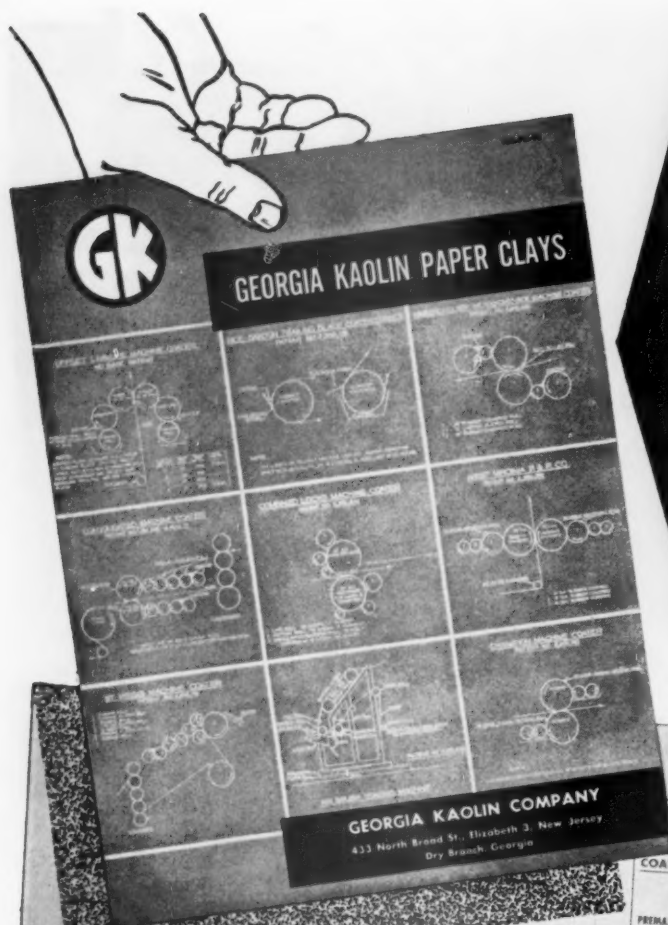
Caustic Soda • Chlorine • Hydrogen Peroxide
Soda Ash



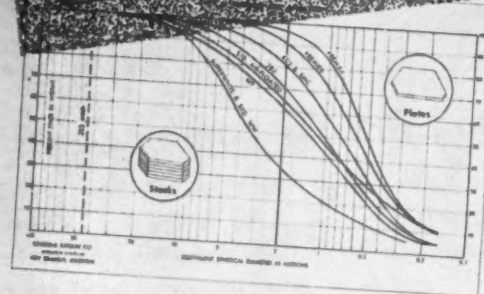
SOLVAY PROCESS DIVISION

61 Broadway, New York 6, N.Y.

SOLVAY branch offices and dealers are located in major centers from coast to coast.



Let this
new bulletin
help you select
the right
paper clay



TYPICAL CHEMICAL ANALYSIS

| | |
|--|--------|
| ALUMINUM OXIDE | 39.38% |
| IRON OXIDE | 43.30% |
| TITANIUM DIOXIDE | 0.30% |
| CALCIUM OXIDE | 1.41% |
| MAGNESIUM OXIDE | 0.80% |
| SODIUM OXIDE | 0.33% |
| POTASSIUM OXIDE | 0.27% |
| LOSS ON DRY AT 650°C. (combined water) | 13.97% |

PHYSICAL CONSTANTS

| | |
|------------------|------|
| REFRACTIVE INDEX | 1.50 |
| SPECIFIC GRAVITY | 2.59 |
| ABRASION INDEX | |

GEORGIA KAOLIN CLAYS

| COATING* | FILLER** |
|----------|-----------------------|
| Premax | WP |
| Premier | Superwhite |
| KCS | Standard Water-Washed |
| SMC | Standard Air-Flashed |
| 282 | |

*Available in Spray Dried, Pulverized or Lump form.
**Available in Pulverized or Lump form.

TYPICAL PHYSICAL PROPERTIES

There's a **SPECIFIC GRADE** OF **CLAY** FOR SPECIFIC PAPER MILL APPLICATION

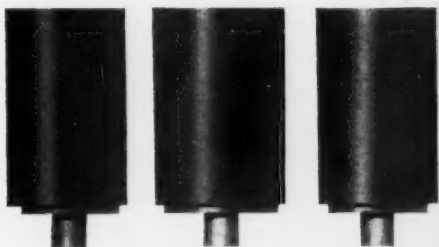
| GK GRADES | PROPERTIES | APPLICATIONS | EFFECT |
|-----------|---|---|-----------------------------|
| PREMAX | Highest Brightness Very Fine Particle Size Specialty Fractionated for Special Adhesive Demand (Pulverized or Lump Demand) | Off-machine Coaters Machine Coaters Size Press Calendar Stack High Brightness Filter Insolvent Pigment Extender | Higher Master G Va |
| PREMIER | Fine Fraction High Brightness Specialty Fractionated from Selected Grades (Pulverized or Lump Demand) | Off-machine Coaters Machine Coaters Size Press Calendar Stack High Brightness Filter | |
| | | High-Solids Machine Coating Medium-Finish Label Low-Cost Enamels High-Grade Publication High-Speed Off-machine Coaters | |

You will want this easy-reading brochure as a handy reference to your choice of the exact grade of clay for your process. Tables indicate in detail the most complete selection of coating and filler clays produced for the paper industry. We will be glad to send you a copy of Bulletin TSB-PC-10 on request.

GEORGIA KAOLIN COMPANY

Sales and administrative offices—433 N. Broad Street, Elizabeth, N. J.

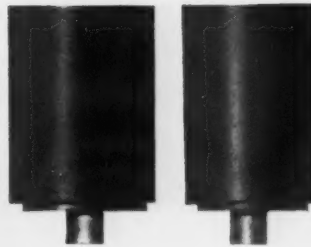
February 1959 — PULP & PAPER



Nekoosa
PAPERS



*Another of the 25 largest
paper companies using S-W
facilities and abilities for the
re-covering of rubber rolls.*



.....ROLL
SERVICE PUTS
MORE PROFIT
IN PAPER

STOWE-WOODWARD, INC. Griffin, Georgia • Newton Upper Falls, Mass. • Neenah, Wisconsin
On the West Coast: HUNTINGTON RUBBER MILLS, INC., Seattle 88, Washington

A SKILLED HAND IN CHEMISTRY...AT WORK FOR YOU

Nopco Paper Chemicals

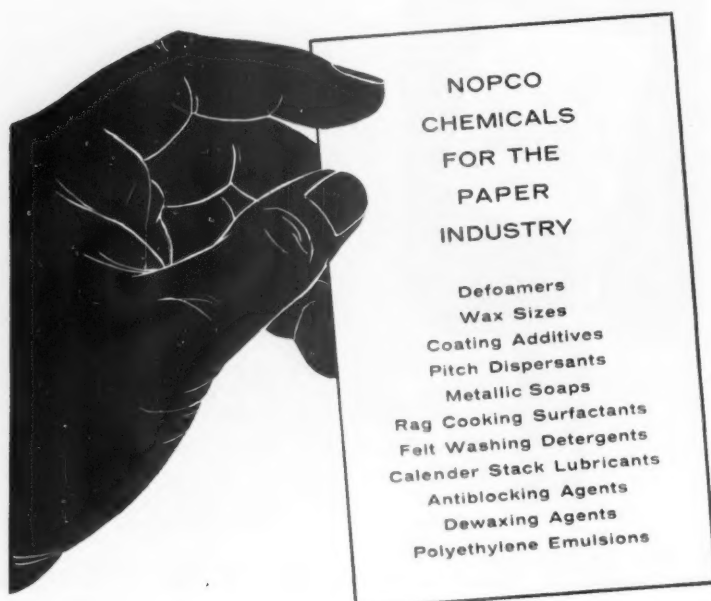
plus Nopco Service

ASSURE SUPERIOR PAPER PRODUCTS

From the Nopco® line of paper chemicals come the agents that make good paper better.

From the Nopco research laboratories come the know-how and techniques amassed in more than 50 years of service to the paper industry—knowledge and facilities that are always available to you to help meet your special requirements.

Write today for complete information about Nopco paper chemicals, plus Nopco research facilities, available to you. You will find it profitable.



NOPCO CHEMICAL COMPANY

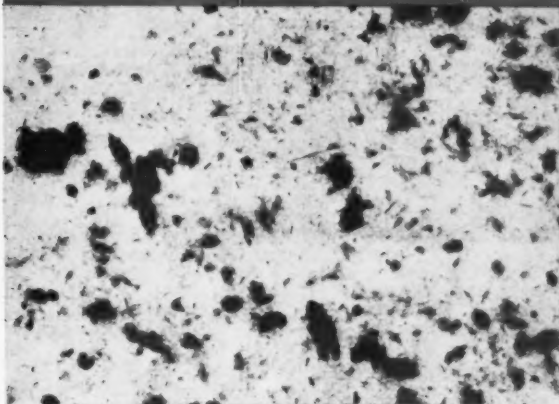
60 PARK PLACE • NEWARK, N.J.



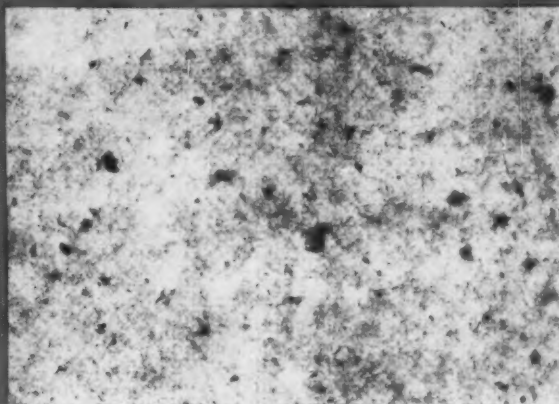
VITAL INGREDIENTS FOR VITAL INDUSTRIES

Harrison, N.J. • Richmond, Calif.
Cedartown, Ga. • London, Canada

Old Kraft Stock
BEFORE the BREAKER TRAP



Same Stock
AFTER defibering in the BREAKER TRAP



Black-Clawson BREAKER TRAP... *Uses 55% Less Defibering Horsepower*

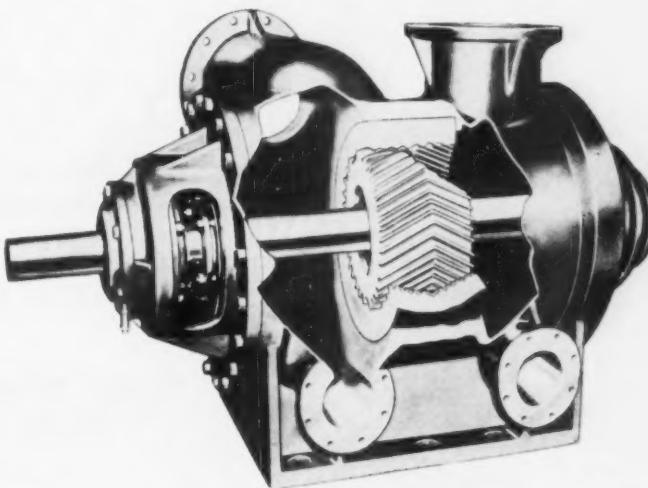
These hand sheets show the degree of selective defibering you can get with a Black-Clawson Breaker Trap installed after your pulper—and you can get it for *less than 2 hp per ton per day*.

Compared with the power needed to obtain the same degree of defibering in a conventional disc refiner, conical refiner or jordan, the Breaker Trap will do the job—and *save as much as 55% defibering horsepower*.

The Breaker Trap efficiently separates fibre bundles and disperses the stock. There is no bar-to-bar contact—usable fibres are salvaged and waste materials are left intact. Maximum screening efficiency for cleaner, higher yield is the result.

It is especially effective for defibering dirty waste papers, old kraft, .009", virgin pulps, de-ink stock, broke stock and has many applications in the pulp mill.

The power savings is substantial, the defibering is excellent, the cost is low. Available in 12" or 18" dia. rotor for either batch or continuous operation. Have your Shartle Division sales engineer show you other hand sheets and application data pertaining to the stock you're using. Or, write to Shartle for complete details on the Breaker Trap.



Long wearing stainless steel rotor and stator of Breaker Trap operates at fixed gap.

SHARTLE
DIVISION
STOCK PREPARATION
EQUIPMENT



THE BLACK-CLAWSON COMPANY
SHARTLE DIVISION, MIDDLETOWN, OHIO

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87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

Proved Engineering for the Process Industries Since 1889

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YOU ASKED FOR IT...AND HUYCK HAS IT!

HUY-5

**THE FIRST AND ONLY ALL-PURPOSE
NATURAL COLOR CHEMICAL TREATMENT
FOR MAKERS OF
HIGH BRIGHTNESS BOARD AND
MARKET PULP**

HUY-5 gives felts outstanding resistance to...

- wear • bacterial and chemical attack
- shrinkage or felting
- changes in running size
- hair shedding

For the full story of the ways HUY-5 contributes to increase production...improve product quality and lower felt cost, talk to the Huyck Sales or Field Service Engineer who visits your mill.

NEW

HUYCK FELTS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870



Huyck Felt Co.,
Rensselaer, N. Y.,
Aliceville, Ala.

Division of F. C. Huyck & Sons,
In Canada: Kenwood Mills Ltd.,
Auriprior, Ontario.

INDUSTRIAL FABRICS



LIFTS 2500 LBS!

NOW! ...climaxing 30 years' leadership in the industrial tractor field, Ford introduces:

NEW! A rugged and powerful tractor designed especially for today's exacting industrial needs.

NEW! A Super-Duty Loader with $2\frac{1}{2}$ times more lift capacity than ever before in Ford history!

NEW! And due at your dealer's soon, an exclusive line of 10', 12' and 14' Ford Backhoes!

All retain Ford's traditional economy, convenience and versatility, yet offer unmatched performance and rugged stamina never before engineered into *any* equipment short of specialized and expensive "heavy machinery."

The all new Ford industrial line will save time, manpower and money in all kinds of construction, materials handling and maintenance work. Get full specifications from your Ford Tractor and Equipment Dealer, or write to Industrial Sales Department, Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.

YOU SEE MORE
FORDS
BECAUSE THEY SAVE MORE MONEY

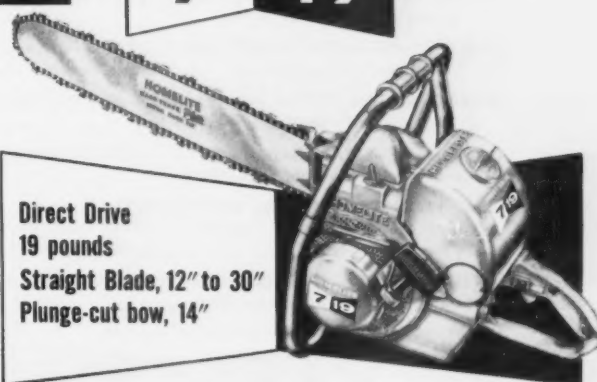


Go into a Partnership for Profit with the New **HOMELITE** 7 19

That's right! The new Homelite 7-19 chain saw is ready to go into partnership to let you *make* more money, *save* more money. Ideal for the production cutter, the 7-19 has a speedy direct drive that cuts through 18" softwood in 12 seconds, 8" hardwood in 4 seconds, fells trees up to 5 feet in diameter. Its balanced 19 pounds* means easier, safer handling in any location, any cutting position . . . lets you cut longer with less effort.

And the 7-19 has all of Homelite's Magic 7 features that give you greater dependability, longer life and less maintenance — automatic governor to maintain proper chain speed . . . tough, drop forged counterbalanced crankshaft to assure smooth running with less operator fatigue . . . large air filter to keep out sawdust, dirt and snow . . . simple piston pump oiling . . . automatic clutch to stop chain when throttle is released . . . revolutionary intake valve to increase engine power . . . and the famous Homelite high compression short stroke engine design that delivers full power in any cutting position.

Join a money making partnership. See a free demonstration of the Homelite 7-19 chain saw at your nearby Homelite dealer's.



Direct Drive
19 pounds
Straight Blade, 12" to 30"
Plunge-cut bow, 14"

Guaranteed for a Full 7 Months . . .

*less bar and chain

HOMELITE

A DIVISION OF TEXTRON INC.

7702 RIVERDALE AVE., PORT CHESTER, NEW YORK

Manufacturers of carryable pumps, generators, chain saws, blowers.





PROJECT PAYDIRT *pays off for you*

NEW CAT D8 TRACTOR SERIES H



THE PAYOFF IN SITE PREPARATION: PRODUCTION UP—OPERATING COSTS DOWN!

- GROUND CLEARANCE NOW 19 $\frac{1}{8}$ "**—an increase of 50%.
- HORSEPOWER INCREASED 18%**—up to 225 from 191 (flywheel).
- SIZE INCREASED**—weight up approximately 4,400 lb. to 47,000 lb., gauge widened to 84 inches.
- LIFETIME-LUBRICATED ROLLERS AND IDLERS**—never need further lubrication until rebuilding.
- DEPENDABLE OIL CLUTCH**—key retained feature for direct drive; practically eliminates clutch down time.
- DRY-TYPE AIR CLEANER**—removes 99.8% of dirt in intake air even under severe operating conditions.
- NEW, STRONGER, HEAVIER UNDERCARRIAGE**—every component stronger through improved materials and heat treat processes.
- BETTER VISIBILITY**—new seat placement, location of console-type controls increases operator efficiency.
- DRAWBAR HORSEPOWER**—up to 180 from 155.
- GREATER STABILITY**—with 5,505 square inches of track on ground.
- SIX DIRECTLY REVERSING SPEEDS**—high forward is 6.3 MPH, reverse is 6.4 MPH (direct drive).

The new Caterpillar D8 Series H Tractor is ready *now* to increase its lead as undisputed king in its size class for forest site preparation. Whatever the job, from land clearing through harrowing, it now has the capacity to set new standards of production in the field.

The D8 Series H is new in design, appearance and performance. It is bigger, more powerful. It incorporates dramatic new engineering advances. It is easier to operate. And *more economical* to own.

Get the full story from your Caterpillar Dealer. Then *see* this great new machine at work on your job. You can't afford not to!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

PROJECT PAYDIRT: Caterpillar's multi-million-dollar research program — to meet the continuing challenge of the greatest construction era in history with the most productive machines ever built.

**BORN IN RESEARCH...
TESTED IN THE FIELD**

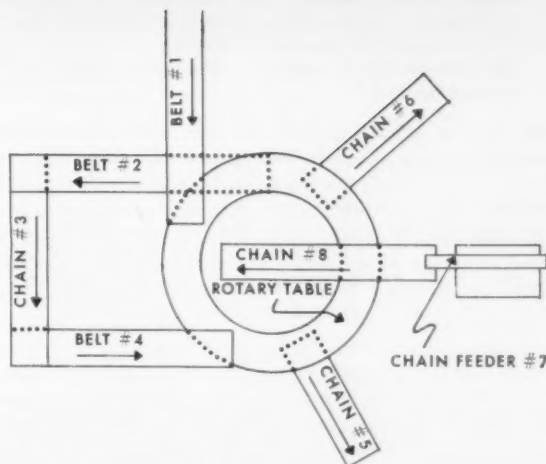
Variable barking-grinding rates synchronized by pushbutton
JEFFREY CONVEYING SYSTEM



At this pulpwood mill, barking drums prepare wood at a 0 to 30 cords per hour clip...grinders consume 4 to 12 cords per hour...Jeffrey conveyors synchronize supply and demand by merry-go-round routing and stockpiling of wood.

Here's how it works: Barked wood is discharged to conveyor #1. More than enough is diverted to conveyor #2 because correct sizes must be selected to efficiently load magazines for batch grinding. Conveyors #3 and #4 take excess wood to rotary table where remote-control plows divert it back to grinders as needed...or to stockpile conveyors #5 and #6. Any deficiency in supply from barking drums is made up by routing wood from stockpiles to rotary table via chain feeder #7 and conveyor #8.

Are you looking for a better way to move materials *where* you want 'em, *when* you want 'em? Jeffrey conveying equipment is built for the long haul, for an uninterrupted flow of operations or flexible stop-n-go handling of materials. Let us show you how to save time and money with Jeffrey conveying equipment. The Jeffrey Manufacturing Company, 809 North Fourth Street, Columbus 16, Ohio.



CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING



"It's faster, more maneuverable

... and does less damage to roads and yards than the track-type loader previously used," according to Mill Foreman Phil Rankin of the C. N. Brown Co., Lovell, Maine. "Our (LO) 'PAYLOGGER' is a great labor saver and, as a rubber tire machine, it has cut maintenance to an absolute minimum. It gives a real feeling of safety to the operator because of overall machine balance and hydro-shock absorbers."

The "PAYLOGGER" line gives you the best performance on wheels. It combines all the high production operating features of the "PAYLOADER", the foremost 4-wheel drive tractor-shovel available, with patented DROTT hydraulic grapples engineered into these highly mobile units. Lifting capacities range from 9,000 to 17,500-lbs., and carry capacities up to 13,000-lbs. DROTT grapples are available to suit handling logs, lumber, pulpwood or slash in woods, yards or mill.

Built throughout for rugged service, "PAYLOGGER" units have exceptional lifting capacities because of sturdy boom arms and a powerful hydraulic system; greater carrying capacity because of a longer wheelbase and greater stability because loads are carried low and close. Power-transfer differentials, power-shift transmission, torque converter drive, heavy-duty planetary axles, power-steer and 4-wheel power brakes are all features that permit a "PAYLOGGER" to carry heavy loads fast and safely ... all by a one-man crew in the driver's seat.

Contact any Hough Distributor to get more complete details of the "PAYLOGGER" line of rubber-tired handling equipment and learn what this high-production combination can do in your operations.



DROTT GRAPPLES FOR EVERY JOB —

Choice of hydraulic grapples to handle all types of work — big logs, small logs, pulpwood, slash and a combination log and lumber grapple for yard or mill.

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Company.....

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1-D-1

It Pays To Charge a Fee

for assistance to small landowners. Requests increased 68% in Wisconsin when industry placed a small price tag on aid

• The importance of selectivity in assistance to small forest landowners was stressed by the U.S. Forest Service in the Timber Resource Review. By concentrating on tracts of 30 acres or larger, 50% of all farm and miscellaneous private holdings could be eliminated with a loss of only 6% of the total commercial forest land area.

On a strictly selective basis the job is as big as it is important to the nation's wood-using industries. Reducing the number of holdings by 50% and the total acreage by 6%, still leaves 2½ million private landowners who control 69% of the commercial forest land in the United States.

The subject was thoroughly discussed during the 25 regional meetings held throughout the country and attended by more than 4,000 people during the past summer and fall.

Who Are Owners?

Folke Becker, board chairman, Rhinelander Paper Co., and president of Trees For Tomorrow, explained the situation in Wisconsin at the first small landowners' meeting at Wausau, Wis., last August.

"In Wisconsin there are only 28 landowners who own more than 5,000 acres each. This pattern of land ownership certainly indicates that the bulk of the forest products of the future will come from small private holdings. Approximately 160,000 of the state's 177,000 forest landowners own less than 100 acres apiece.

"Sixty-eight percent of the commercial forest land in Wisconsin is privately owned. This is one of the major reasons why Trees For Tomorrow was founded in 1944. Working to develop the full potential of these 11 million acres remains the prime function of the organization," Mr. Becker said.

A surprisingly large acreage, three million acres or 27% of the private holdings in Wisconsin, are controlled

Three Reasons for Fee System in Wisconsin

In this era of widespread free assistance to small forest landowners, what is the reaction when a nonprofit industry organization places a fee on the technical services of its foresters?

The experience of Trees For Tomorrow Inc., covering a span of 15 years, shows that the following significant factors apply insofar as northern Wisconsin is concerned:

1. Most Americans expect to pay for what they receive and question the "something for nothing idea."
2. It is impossible and impractical to sell forestry to every landowner with a small patch of trees.
3. The idea back of the fee plan is not profit but selectivity.

by absentee owners. As a group, they demonstrate an increasing awareness of the importance of forest management. A good share of Trees For Tomorrow's forest management is being directed to this field.

Free Service Was Tried Out

For eight years Trees For Tomorrow offered management assistance free of charge. Attitude surveys proved that the free assistance was not the sole answer to increasing productivity on private woodlands.

Trees For Tomorrow found that small fees automatically eliminate landowners who just go along for the ride. Time consuming work checking tracts of negligible value is eliminated. The fee plan also fosters a feeling of self help based upon the landowner's own initiative.

One landowner, answering an attitude survey, said, "Most people like to feel they can accept services without being obligated. By permitting them to pay a small portion of the cost your relations are on a firm basis."

Another landowner said, "When you offered this service free, many of us wondered what the angle was. We thought that if you made a management plan we were obligated in some way. By paying for management assistance we're under no obligation."

Reaction to the Fee Plan

Results prove landowners are more likely to carry out management recommendations if they have an investment in the management plan.

During the past 13 years Trees For Tomorrow has prepared 713 plans for 221,380 acres. The number of fee plans prepared during the past five years increased 68% over the previous five years when assistance was offered free. The number of acres rose 16%.

These management services evolved from the original reforestation work of Trees For Tomorrow. Two foresters now work full time on forest management. Two others teach forestry at the Trees For Tomorrow Camp. All prepare management plans during the winter.

Five Services Are Offered

The specific management services offered are:

1. General reconnaissance survey at 10 cents an acre. This plan includes a cover type map, a written report with description of species and size, planting recommendations and where trees should be harvested or let grow.
2. Intensive forest management plan at 20 cents an acre. This work manual includes a series of maps on a scale of 12 inches to the mile. The page opposite each map contains spe-

cific data for that tract. Information covers degree of stocking, estimated volume and income, suggested methods of harvesting, planting, discing for reproduction and stand diameter classification. Space is provided for an activity record.

3. Marking and estimating at \$3 per hour for forester, \$1.50 for tallyman (landowner may act as tallyman), \$1 per quart, for paint.

4. Supervision of harvest at \$3 per hour. This service was initiated in 1958 to fill a gap when a landowner was unable to look after harvesting details recommended in a management plan. Foresters handle all phases from contacting a reputable timber producer to supervising cutting. The producer is responsible for marketing.

5. Machine tree planting. Under the package plan, the landowner buys trees from a state or private nursery; Trees For Tomorrow surveys the planting site, prepares a planting plan, provides tractor, planting machine, crew and forester to supervise. Cost for use of the machine, tractor, crew, aldrin spray for white grub control and 3 year old trees average \$25-\$27 per thousand.

In cases where technical aid is a necessity and the landowner unable to pay a fee, assistance is provided without charge.

Policy Decided by Committee

Management activity is planned and evaluated by a forest management policy committee. It also is re-

viewed by the board of directors of Trees For Tomorrow. Members of the policy committee are: E. B. Hurst, manager of timberlands, Consolidated Water Power & Paper Co., chairman; George Kilp, woodlands manager, Nekoosa-Edwards Paper Co.; Ward Smith, woodlands supt., Rhinelander Paper Co.; and William Yost, director of wood procurement, Kansas City Star Co., Flambeau Paper Division.

Trees For Tomorrow's educational work supplies many contacts with landowners which often lead to management requests.

Trees For Tomorrow distributes 500 free trees each to 500 landowners in the spring. A landowner may receive free trees for two years. The objective, after the second year, is to interest the landowner in large scale reforestation, machine planting and forest management.

The 1957 survey found that landowners receiving free trees since 1944 had machine planted 5,248,265 trees in 1957. The six state nurseries reported that in 1957 one-fifth of the tree orders came from landowners who previously had received free trees from Trees For Tomorrow. They reported harvesting 29,223 cords of pulpwood and 3,888,538 board feet of lumber.



Smith Taylor Becker MacLaren Hurst

TREES FOR TOMORROW OFFICERS ARE "DEEPLY ROOTED" . . . Same executives have guided organization since 1944. They are David B. Smith (pres., Wausau Paper Mills) secy.-treas.; M. N. Taylor (Merrill, Wis.), executive director; Folke Becker (board chairman, Rhinelander Paper Co.), president; C. G. MacLaren (vice pres., Owens-Illinois Glass Co.), vice pres., and E. B. Hurst (manager of timberlands, Consolidated Water & Power Co.), vice pres.

Trees For Tomorrow Will Be 15 Years Old

Trees For Tomorrow, Inc. rounds out 15 years of operation March 1. It is sponsored by 13 paper companies and five power companies representing the bulk of the paper and power producing capacity in Wisconsin. Officers are shown in photograph accompanying this article.

Members of the board of directors are: Stanton Mead, president, Consolidated Water Power & Paper Co.; Thomas Leech, president, Whiting Plover Paper Co.; N. S. Stone, president, Mosinee Paper Mills Co.; R. J. Sund, vice pres. & gen. mgr., Marathon Div. of American

Can Co.; K. S. Dickinson, president, Tomahawk Pulp Co.; Leonard Kuehl, exec. vice pres., Kansas City Star Co., Flambeau Paper Div.; H. P. Taylor, president, Wisconsin Public Service Corp.; H. G. Wintgens, exec. vice pres., Charmin Paper Products Co.; Walter F. Adrian, pres. treas. & gen. mgr., Badger Paper Mills, Inc.; W. E. Schubert, vice pres. & gen. mgr., Wisconsin Michigan Power Co.; W. F. Mertens, sec. & treas., Chippewa & Flambeau Improvement Co.; G. A. Donald, president, Lake Superior District Power Co.; F. G. Kilp, woodlands mgr., Nekoosa-Edwards Paper Co.; M. H. Frank, Franklin Van Sant & Assoc., and C. R. Seaborne, exec. vice pres., Thilmany Pulp & Paper Co.

Good Management is Taught

Trees For Tomorrow holds forest management clinics at demonstration plots in the industrial forests of its members. These clinics bring the landowners into the woods to see how trees can be managed as a crop. Specific steps in carrying out recommendations of a management plan are explained. Last August, 130 landowners attended the clinic held at Consolidated Water Power & Paper Co.'s Gagen Experimental Forest.

Resource management is taught at the Trees For Tomorrow Camp at Eagle River, Wis. This past season 3,912 persons studied from March to November, bringing total registration since 1946 to 33,000.

Workshops Bring Results

Workshops are held for a wide cross section of Wisconsin citizens. Agricultural teachers and 4-H club leaders return home and encourage farm woodlot owners to seek management assistance. Summer sessions are held for teachers. High school and county teacher college students attend sessions in the spring and fall. Adult sessions are held throughout the season.

The Wisconsin Bankers Association bought 20 planting machines as a result of interest stimulated at Camp workshops. Landowners may rent these machines through county agents.

| OWNER | | PROPERTY | | DATE | | CITY/STATE | |
|----------------------------|------------|--------------------------|----------------------|----------------------------|---------|----------------|----------|
| FOREST MANAGEMENT ACTIVITY | | Trees For Tomorrow, Inc. | | Dawson, S. S. | | Grandon Forest | |
| PLANTING AREA | | 6 | | ACRES | | 1950 | |
| PLANTING PROBLEMS | | | | | | | |
| PLANTING ACCOMPLISHED | | | | FOREST MANAGEMENT ACTIVITY | | | |
| DATE | SPECIES | NO. OF TREES | ACTIVITY | DATE | SPECIES | NO. OF TREES | ACTIVITY |
| 1951 | 1-0 Norway | 2,000 | 1 1/5 Acre Inventory | 8-50 | | | |
| 1952 | 1-0 Norway | 2,000 | Plots - Installed | 12 | | | |
| | | | Reclaiming Aspen | 100 | 8-50 | | |
| PLANTATION SURVIVAL | | | | REMARKS | | | |
| DATE | SPECIES | NO. OF TREES | ACTIVITY | DATE | SPECIES | NO. OF TREES | ACTIVITY |
| 8-52 | | 90 | Harvest - 300 cords | 10 | | | |
| | | | 1954 Board feet | 18 | | | |
| | | | 105 Dead trees | 15 | 1952 | | |
| | | | Total Trees Planted | 95 | | | |
| | | | 4800 | 80% | 1952 | 246 | |
| REMARKS | | | | ANNUAL HARVEST FOR NEXT 10 | | | |
| | | | | YEAR PERIOD IS 200 CORDS | | OF ASPEN. | |

HOW RECORDS ARE KEPT UP-TO-DATE . . . The McBee Key Sort system keeps record of contacts with more than 6,000 landowners. The reverse side of this McBee card contains additional information on costs for machine planting job as well as a map of the area planted.

Industry Develops "Cone Orchard" Program

Based on results of recent research findings, Weyerhaeuser Timber Co. anticipates establishing Douglas fir orchards which "promise a yield of seed five times greater than that obtained from trees growing under natural conditions," says Research Supervisor W. H. Cummings.

This high yield has been achieved through application of soil developments and treatments developed to control damaging insects.

"Instead of relying on seed from wild trees," according to Mr. Cummings, "foresters are looking forward to the day when seed can be collected on a more stable basis from genetically superior trees. Wild trees produce an adequate amount of seed about three years in ten, on the average. In poor seed years, like 1958, special areas of forestland managed primarily to produce more and better seed, can supply the demand for seed created by yearly reforestation programs."

Adoption of the seed orchard program is the result of cooperative research by Weyerhaeuser and Industrial Forestry Assn. on Douglas fir seed production. Leading participants: Dr. John Duffield, IFA geneticist, developed methods for growing better wood faster and to obtain quality seed from superior trees; Dr. E. C. Steinbrenner, Weyerhaeuser forest soils specialist, worked to improve growth conditions permitting landowners to attain greater seed production per tree; Norman Johnson, Weyerhaeuser forest entomologist, worked on a program to reduce insect damage to Douglas fir cones and seed.

According to Harold Reichel, manager of the company's Vail-McDonald operation in Washington state; "Seed cone orchards throughout the Pacific Northwest will one day provide annual crops of top-grade seed that will produce the superior forests of the future."

St. Regis Supplied Eisenhower's Xmas Tree

This year the distinction of providing the national Christmas tree went to St. Regis Paper Co.'s J. Neils Lumber Co. div. in Libby, Mont. where the 99 ft. Engelmann spruce was harvested and shipped to Washington for erection on the White House grounds. Herbert Stout, company faller, felled the tree with a Remington power saw which was later presented to him as a souvenir. Although reportedly the tallest tree ever used in the White House ceremony, Sen. Murray modestly classified the 78 yr. spruce as a "Montana shrub."

Other adult groups have established demonstration forests as a result of attending Camp. Since last spring the Kiwanis clubs of Antigo and Green Bay, Wis., and the Wisconsin Press Association have set up such tracts. They will be used primarily to demonstrate how supposedly wornout land can be turned into a profitable forestry operation through sound management practices.

Trees For Tomorrow provides free forest management assistance for such educational and memorial forests. Following World War II this industry sponsored organization was instrumental in establishing 35 school and eight memorial and demonstration forests.

These observations are not intended as a blueprint to solve a key national forestry problem. However, the fee plan follows along the line of the

policies recommended by the Forest Industries Council.

The important role of the consulting forester has not been discussed. Trees For Tomorrow turns requests for technical aid over to consulting foresters when it is to the best interest of the landowner, particularly when marketing problems are a dominant factor.

Back of the fee plan is this psychological theory. Payment of a fee develops sort of a partnership relationship between Trees For Tomorrow and the landowner. When a landowner pays for technical aid he has a stake in activating a management plan. He will not get his money's worth unless he follows the recommendations.

This is a normal situation to most Americans. If you want something of value you expect to pay for it.



WORKSHOP—HELD FOR PRIVATE OWNERS has its camp here. This group is on a field tour of Consolidated Water Power & Paper Co.'s Gagen Experimental Forest. Foresters from Trees For Tomorrow and member paper companies explain growth, volume and income data from one-fifth acre sample inventory plots. They also demonstrate discing, planting, pruning, harvesting and other forestry practices.

Better Chip Techniques

are disclosed at APA Technical meeting in San Francisco—efficiencies developed to improve loading, storing, sampling, etc.

San Francisco . . . Rapid progress in pulp chip production, handling, transport, storage and physical specification is improving the industry's position for economic fulfillment of its pulpwood requirements.

The significance of these developments was brought out at the recent meeting of Western Technical Committee, American Pulpwood Assn. This session—the first held by the newly formed committee in this area—took place in San Francisco, each participant covering a specialty phase of the rapidly expanding chips field.

APA President George B. Amidon, of Minnesota & Ontario Paper Co., stressed the significance of developments in the pulp-chip field. He predicts a two million cord per year increase in pulpwood consumption during the next ten years. Chairman R. L. DeLong, of St. Regis Paper Co., Tacoma, Wash., presided.

Chipping in the South Extends to Small Sawmills

The first shipment of pulp chips made in the South by the lumber industry took place in 1952, according to T. N. Baker, St. Regis Paper Co., Jacksonville, Fla. Subsequent developments, both rapid and extensive, have increased production of chips from the lumber industry to 1.2 million cords per year—6% of the South's pulpwood requirements. As of 1951 the Southern industry was feeling need for debarkers which were economically and productionwise suitable for use in sawmills of the area.

Progress was such that by 1955 sawmills of 35 mbf per day capacity were debarking sawmill logs and converting the resultant bark-free leftovers into pulp chips. Continued development has since extended the economic limits down to the point where, according to Mr. Baker, it is now justifiable to install debarkers in mills producing only 7 mbf lumber daily. Debarking costs about \$1.70

per M ft. of logs at some of the smaller mills.

Also in Northeast

Results of similar development is apparent in the Northeastern states, according to J. S. Hensel, APA forest engineer. Sawmills of 30-40 mbf daily capacity successfully incorporate both debarking and chipping facilities and convert clean by-product wood into marketable pulp chips on a paying basis. Small sawmills of 8-9 mbf capacity are successfully processing logs with modern debarkers. Chipping plants at concentration yards tributary to groups of these sawmills are converting the resultant chippable residue wood into pulp chips. Chipping units of this sort can operate with 3-man crews.

Effective Use of R.R. Cars And of Truck Transport

Chip transport between producing mill and the consuming pulp mill assumes various forms. The two main types of hauls are rail and truck but barges and direct delivery by pipeline are factors for mills favorably situated to take advantage of such arrangements.

L. J. Forrest, of Rayonier Inc., Hoquiam, Wash., pointed out that Longview Fibre Co. makes use of 800 specially converted rail cars for receiving 20,000 carloads of chips per year.

Effective utility of rail cars depends not only on construction factors of the car itself but also on facilities and arrangements at the plant receiving the chips. Chips from hopper bottom cars can be discharged into a receiving pit as rapidly as 6 to 7 min. per load when using shakers of effective design. This compares to an hour to unload a car of chips by suction-pipe systems.

Car unloading is not the whole factor though, as chips in the bin have to be removed before additional chips can be dumped in the same place.

Chips pneumatically removed from cars enter the plant transport system immediately as in-car displacement takes place. As a car is emptied pneumatically, the system is immediately available for removing chips from the next car.

Truck Hauls Up to 135 Miles

Truck transport of chips is strategically important in the recovery of usable by-product wood chips in many areas. Five western Washington mills are receiving over 2,500 tons of truck-hauled chips per day, reports H. E. Lovejoy of Puget Sound Freight Lines, Seattle. The cited hauls range in length from 2 to 135 miles.

Mr. Lovejoy feels that progress to date in transporting chips by truck is "only the beginning." He says, "Selection of hauling equipment depends on many factors, including length of haul, road conditions, legal weights and dimensions, loading and unloading requirements."

Truck-hauling equipment is expensive and wood chips a low-value, high-volume commodity, thus forming a combination making it "very important" to obtain maximum utilization for every piece of equipment, reports Mr. Lovejoy. His organization, which pioneered truck and barge transport in the Puget Sound country, achieves this by working maximum capacity equipment as many hours as possible each day and providing rapid loading and unloading facilities.

Truck and/or trailer chip unloading arrangements can be obtained in various types. Conditions at the receiving mill have considerable bearing on the selection. Dump trucks, using 5- to 6-unit bodies, unload rapidly without need of other facilities and are suitable for hauls of 15 miles or less but are not the most efficient method for high-volume hauls.

Self-dumping semi-trailers of 10-unit capacity can unload adjacent to stockpiles where space is limited and facilities lacking. End-dump combina-



DeLong Amidon Forrest Blackerby Lovejoy

PANEL SPEAKERS AT APA WESTERN MEETING: Chairman R. L. DeLong, res. woodlands mgr., St. Regis, Tacoma, Wash.; APA Pres. G. B. Amidon, dir. of woodlands, M&O Paper, International Falls, Minn.; L. J. Forrest, mgr. Northwest thr. div., Rayonier, Hoquiam, Wash.; L. H. Blackerby, Western editor, P&P, Portland; H. E. Lovejoy, exec. vice pres., Puget Sound Truck Lines, Seattle.



Gruenfeld French Hensel Robinson Baker

Jay Gruenfeld, asst. land supervisor, Weyerhaeuser, Tacoma; R. P. French, Larson & Baardson, Portland, Ore.; J. S. Hensel, APA forest engr., Wausau, Wis.; Joseph Robinson, head chip studies, Simpson Paper, Everett, Wash.; T. N. Baker, res. woodlands mgr., St. Regis, Jacksonville, Fla.

tions include semi-trailer (most popular), truck-and-trailer, doubles.

The semi-trailer has "good capacity, is easy to handle and probably the most efficient except for longer hauls." Semi-trailers with belt unloaders provide self unloading at low capital cost. These are adaptable to delivery direct to pulp mill conveyor systems (at about one unit per minute) or to pit or stockpile with minimum facility requirements. Loss of payload is a detrimental factor on long hauls; rapid unloading important on short hauls.

Regarding the future truck-hauling of chips, Mr. Lovejoy states it will inevitably become more important to the industry. "Dependable common or contract carrier service can be developed by simple recognition of the profit motive and the requirement that bidders show proof that their proposal is compensatory. Attention to this

principle will foster the creation of a valuable utility for the people who are interested in the transportation of wood chips."

Unloading at Receiving Mill Is Prime Cost Factor

This must be considered when planning a new pulp mill or improving an existing one, according to R. P. French of Larson & Baardson Inc., Portland, Ore. He says many plants are confronted with the problem of improving chip-receiving arrangements—a production factor which "has not kept pace with improvements in methods and production of the modern mill's expansion program."

The new chip dumping-weighing-transport system of Cascade Kraft Corp., Wallula, Wash., was the example cited for modern chip receiving.

This installation includes a platform 65 ft. long onto which either a rail car or truck with semi-trailer moves for unloading. After recording gross weight on the component's 100-ton scale and securing the vehicle in position, the platform inclines (with loaded vehicle) to discharge the chipload through hinged end-door of the haul unit into a receiving pit from which the chips are pneumatically removed for transport to outside storage and to the pulp mill. The 90-ton lift inclines in 2½ minutes to 58° slope and the chips slide out freely. The dumper "can easily unload three rail cars per hour," reports Mr. French.

Chip Compaction Is Important

Compaction, a factor involved in loading, unloading, storage and most types of transport, reaches maximum economic concern for hauls paid for

on the basis of cubic capacity of the carrier unit. Jay Gruenfeld, Weyerhaeuser Timber Co., Tacoma, reports compaction to be of prime importance when shipping via rail where rates are based on cubic measure. He says compaction loading systems pay off on hauls of this type.

For effective compaction, chips should lie flat, be of uniform size and air-loaded at high velocity. Gravity-loaded chips take on a loose, jack-straw formation which is satisfactory for most highway truck hauling. Restrictive weight limitations on public roads are such that maximum legal payloads can be obtained by gravity loading. Under these conditions non-compaction can be of considerable advantage because they unload easily and rapidly.

In unloading chips at the Cascade Kraft platform dumper, the "not so compacted" chips from truck-trailers discharge by raising the load to 45° incline as compared to 58° for compacted chips from rail cars. Compaction loading results in around 130 to 135% payload as compared to 100% for gravity loading.

Outside Chip Storage Is Proving Big Success

This form of storage is an effective tool developed by the West Coast industry chiefly to facilitate large-scale economic utilization of wood residuals, and it has been recently adopted by so many mills that it's bordering on general practice in that region, said PULP & PAPER's Western Editor, Louis H. Blackerby.

ern Editor, Louis H. Blackerby.

Reporting to the committee on outside storage developments, Mr. Blackerby attributed important significance to this production phase in the successful utilization of pulp chips derived from mill leftovers.

The equivalent of over 1.2 billion bd. ft. of residual mill wood was utilized by the industry's Washington and Oregon mills in 1956. In Washington, 839 million bd. ft. of leftovers from the manufacture of lumber and veneer were used that year for producing pulp. This is 4% times the amount of leftovers used for the same purpose in 1948 and accounted for 34% of the state's entire pulpwood consumption in 1956, he said.

Although the advent of outside chip storage trailed the industry's early acceptance of mill residue chips by several years, the proven success of outside storage at consumer mills was a significant factor ushering in the vast increase in use of by-product pulp chips during the last three years, according to PULP & PAPER's Western Editor.

One West Coast mill inaugurated outside storage of chips in 1949. Five more Coast mills were doing so by the end of 1955. "Since then the swing to outside storage increased at an accelerated rate," said Mr. Blackerby. "During the subsequent three year period outside chip storage has been inaugurated at 13 Western mills—three in 1956, six in 1957, four in 1958. These include kraft, mechanical groundwood, semi-chemical, MgO & high-yield sulfite operations in Calif.,

Ore., Wash., Mont. and B.C."

This storage serves as a "flow-eveing device" advantageous to both chip suppliers and receiving mills; it provides an economical supply of raw-product wood in immediately usable form which can be received, stored and delivered to digesters at costs reported to be as little as \$1 per unit, or less, under favorable conditions. The effect of this increased wood utilization is, in itself, a materially beneficial factor—both in forest management and the region's economy. At the present rate of using mill leftovers for pulp, the effective timber supply in Ore. alone is enhanced by more than 100 billion feet. (See PULP & PAPER Sept. 1958 for survey outside chip storage on West Coast.)

Benefits Derived From Chip Specification Studies

Simpson Paper Co., Everett, Wash. disclosed findings beneficial to supplier and receiver mills, according to Joseph Robinson who heads this project. Automatic sampling of each load of chips arriving at the Simpson plant provides the company with means of keeping accurate data concerning individual shipments from each of the participating mills.

Mr. Robinson reports that unscreened veneer chips have been proven as high in quality as screened chips received from sawmills. The Simpson plant currently receives chips from five sawmills and two plywood plants. The studies have disclosed chip lengths of $\frac{3}{16}$ and $\frac{1}{16}$ in. to be "ideal" for this plant; shipments containing $\frac{3}{8}$ bark and/or rot are acceptable while loads containing 2% are rejected. Penalties are levied for loads containing unsatisfactory amounts of "fines."

APA Program at Paper Week

To feature recreational needs, lower production costs, wood quality, promise of hardwoods and improving small woodlands.

The American Pulpwood Assn. will hold its annual meeting at the Waldorf-Astoria Hotel in New York City, February 23 to 25.

The opening session will be the Forest Policy Forum held on Monday night and this year's theme will be the impact of recreation on privately owned lands. This topic was chosen because of increasing pressure for more natural recreation facilities stemming from the continued population growth. Such pressure will make it imperative that the industry correlate

its primary objective of growing trees with the nation's recreation needs.

Bernard L. Orell, vice president, Weyerhaeuser Timber Co., was recently appointed by President Eisenhower to the National Outdoor Recreation Resources Review Commission, will chairmen the sessions. Speakers will touch on hunting and fishing, water conservation, camping and picnicking and land use planning.

The technical sessions will lead off with new interests which promise lower production costs and will fea-

ture speakers on new interests in tree planting; utilization and its relationships to pulpwood production costs; improvement ideas for mill woodyards; and a panel discussion on the theme by six regional technical committee chairmen.

The general pulpwood industry session will learn about wood quality evaluation from increment cores; there will be a panel on the promise of hardwoods; a discussion on improving small woodlands and insect and disease control and its public implications.

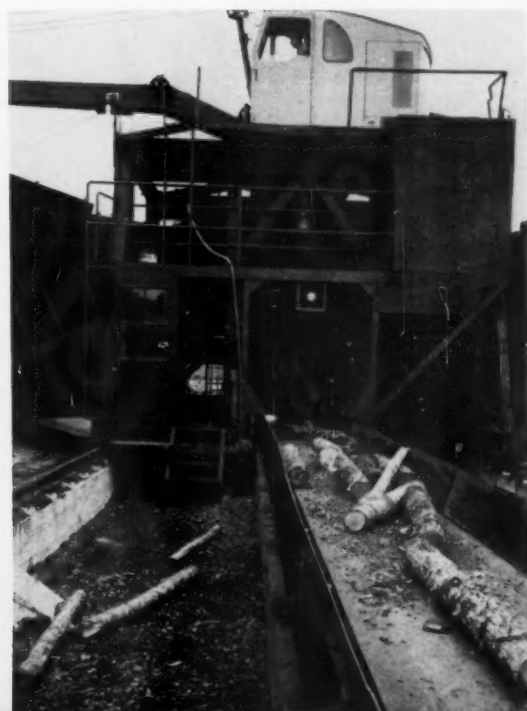
Executive Secretary W. S. Bromley will be the annual luncheon speaker, and will talk about the purpose and meaning of the International Labor Organization Conference in Geneva, Switzerland, on the timber industry which he attended in Dec. 1958.



CARRYING PULPWOOD TO MILL, Chesapeake's 1400 ft. rubber belt performs same function as chain conveyor or flume.

CASE HISTORY: Why Chesapeake Is Sold On Rubber

Convinced it would do a tough job, they put rubber to work in transport of wood. There were design problems.



West Point, Va.
• Recently O. H. Sikes, master mechanic and maintenance supervisor at the Chesapeake Corp. of Virginia, changed the belting on a chip conveyor for the first time in 10 years.

During its life, the belting had handled the chips from about 2,200,000 cords of pulpwood.

"The belt took a bad beating because it ran about 30 inches below the chippers, where it received heavy impact," Mr. Sikes said. "We had expected the belt to last only three years. It had worn thin in 10 years. But it had done a full job."

This was not Chesapeake's first

SPECIALLY DESIGNED CHUTE and lip in Lorain rake changes flow of logs so they fall flat on belt.

testimonial to the tenacity of rubber. For the past ten years, the woodyard at the West Point, Va., mill has been a network of rubber conveyors, doing every job from handling raw logs right off the flatcar to conveying chips and bark. Belts are also used for conveying hot stock and coal.

When this system was in the construction stage in 1947, there were some disbelievers. They said: "Rubber won't take the beating . . ." They said: "Logs will chew them to pieces . . ." They said: "Unbarked pulpwood will tear them up . . ."

"They" were wrong and the record bears this out.

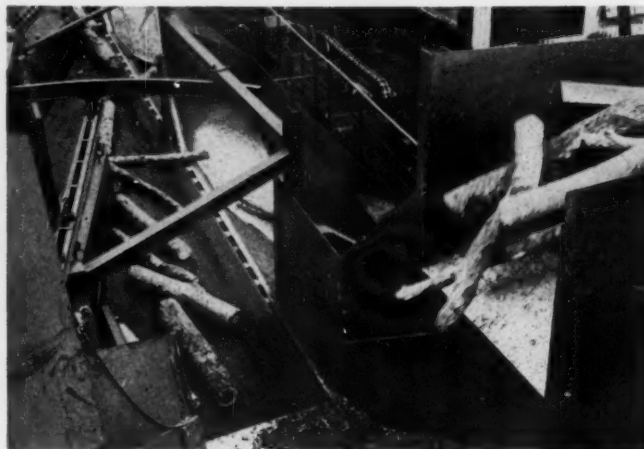
What Are the Facts?

Based on a decade of experience with rubber belts of all sizes, here is

Pulpwood Section



WRONG WAY TO TRANSFER PULPWOOD from one conveyor to another is apparent here. Spillway is too narrow for volume of logs and drop is too flat. Pulpwood jams up, bark collects on lip.



RIGHT WAY IS AT THIS POINT where wood is delivered to the moving belt platform at debarkers. Lip at bottom of spillway shoots logs straight out so they land flat and at about same speed.

why Chesapeake is proud of its rubber conveying system. Mr. Sikes says:

"1. Rubber is versatile—whereas chain conveyors can operate up to about 300 ft. centers, rubber belts 1400 ft. long with 700 ft. centers are used effectively at Chesapeake. This same conveyor, if it were metal, would have to be divided into two or three conveyors.

"2. Power demands are less with rubber—a 50 hp motor using about 35 hp drives the 700 ft. center belt conveyor at Chesapeake. It takes 50 hp at least to drive an average 300 ft. center chain conveyor, and hp increases as speed increases. Rubber can be driven 500 fpm with little more hp than it takes to drive it 150 fpm.

"3. Rubber lasts longer—Ches-

apeake claims its rubber belts carrying unbarked pulpwood are giving roughly twice the life they got from metal conveyors in the past. Rubber has no joints, is not as allergic to sand and grit. Some of the original six-ply, 32-oz., 36 in. wide rubber put into service in 1948 is still being used.

"4. Maintenance on rubber is lower. There isn't the constant wearing away of chain and steel from the conveyor trough with rubber belts. Things do happen to rubber belts, however—such as a 300 ft. rip in one of our main line log conveyors. But this was repaired with metal clips and ran satisfactorily until it could be vulcanized or replaced. Some of this repaired belt is running today."

"5. General overall economy."

Using rubber for these tough conveying jobs was initiated when Sture G. Olsson, now president and general manager, was Chesapeake's plant engineer. Mr. Olsson is the son of Elis Olsson, chairman of the corporation, who played a major role in the introduction of kraft process to the U.S. and in 1918 was one of the leading organizers of the company.

Sture Olsson observed the limited use of rubber belting in Canada. He was convinced that rubber would be a much more economical means of handling pulpwood, would give better service. He contacted Tidewater Construction Co. of Norfolk, Va., to design the system in the woodyard in cooperation with Chesapeake's engineering staff.



FED BY SHIPYARD CRANE, shorter belt conveyor carries wood from barges. It has same type bark trough as main conveyor.



FLANKED BY RIBBONS OF CONCRETE, to catch stray bark, rubber conveyor features low horsepower demand, little maintenance.

Problems of Design

Some of the problems in basic design were difficult. Men like Ray Tokarz, Chesapeake's present plant engineer, have been constantly at work perfecting new and better methods for operating the system since it was designed.

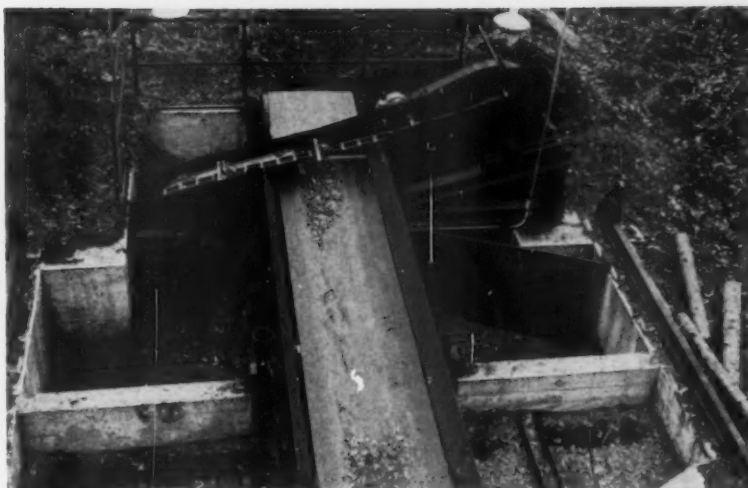
The system consists of, first, a 1400 ft., 36 in. wide major conveyor running adjacent to the rail lines. This empties onto a second conveyor which in turn dumps logs on a 72 in. wide inclined rubber belt. This conveyor delivers the logs to a 72 in. wide belt which feeds the debarkers. Three electrically operated plows deflect the logs off the belt into the barking drums. Since Chesapeake also receives pulpwood by barge, a third conveyor delivers logs from the docks to the debarker feed belt.

After studying the problem of wear on the rubber belting, Chesapeake engineers determined that, for the best operation, logs would have to fall on the conveyors at about the same speed the conveyor was moving and in the same direction. This prevents logs from digging into the rubber or tearing it.

Chutes at transfer points also must be steep enough to permit the free flow of bark, preventing it from clogging, yet not too steep or logs fall on conveyors at too high a speed and tend to tear the belt.

The chutes are designed with a lip extending out over the conveyor. The logs are thus slowed to the right speed and drop flat on the belt. Bark which tends to collect on the lip is swept off by the moving logs.

A special chute was designed for the Thew-Lorain rake used to clean logs off flatcars. The logs are raked onto a short conveyor below the crane. This conveyor dumps them into a chute in the middle of the crane, then



BARK FALLING THROUGH OPEN EDGES OF CONVEYORS is plowed off underside of belt as it turns around. Small dragline shown here dumps it back on topside. At other end of conveyor it drops to other logs conveyors and then through the barking drums where it is separated from logs and sent to bark storage bin to be used for fuel.

off a metal lip onto the conveyor.

One of the busiest belts is 36 in. wide and 775 ft. long and handles up to 140 cords an hour at 500 fpm. The belt is 5-ply, 42-oz. rubber. The last belt was three and a half years old when it was replaced.

"We figured we got more than our money's worth out of it," commented engineer Tokarz.

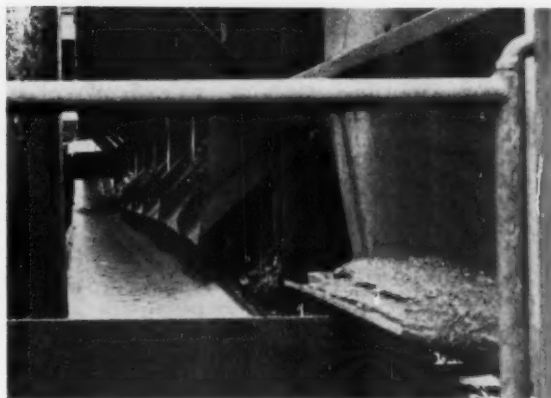
A special system for reclaiming bark spilled off the carrying side of the belting has been devised. The loose bark topples around the edges of the belt and is deflected by skirts to the return belt underneath.

The return side, instead of having conventional return idlers, has troughing idlers to give bark-carrying capacity. This bark is conveyored to the tail end of the conveyor, where it is

swept off into a drag chain conveyor and returned to the carrying side to go to storage bin.

Bark is fed out of the steel storage bin from the bottom by a Miller-Hofft screw type conveyor which literally augers it onto a rubber belt for delivery directly to the burners. Chesapeake's engineers have found this screw feed system to be the best they have tried for getting the tightly packed bark out of the bins.

A concrete spillway is also provided between railroad tracks and the conveyors to collect any bark which falls loose. Bark is collected from here by Dempsey Dumpster and fed onto the burner conveyor. In this way, Chesapeake claims 90% and more of bark from pulpwood, is reaping generous returns in power from the system.



THIS CHIP BELT IS ONE OF ORIGINAL conveyors installed in 1948. The original rubber belt lasted for ten years.



BARK IS "MONEY FROM HOME" so Chesapeake takes careful measures to reclaim all it possibly can. Here another belt catches debarker waste, delivers it to burner.

PULP & PAPER

Pulpwood Section

Paint Hard Hats As a Safety Measure

Increased safety in woods operations at J. Neils Lumber Co. div. of St. Regis Paper, Libby, Mont. has been achieved with paint. Company foresters find that hard hats painted with Day-Glo paint can be easily spotted at a distance even in the darker heavy-growth areas. This increased visibility makes it possible for workmen to see each

other more readily. As a result the hazards have decreased while efficiency increased.

Day-Glo is a semi-luminescent coloring used in aviation to make aircraft easier to see.

Mouse Creates Forest Problem

The white-footed deer mouse destroys more coniferous tree seed than any other rodents, according to re-

cent studies at Oregon State College. Two mice per acre can consume in five weeks the half-pound of seed usually sown in artificial seeding. The per-acre mouse population runs from 2 to 8 in the study area.

Early control methods, based on using rodenticide treated cereal grain, were only partially effective due to rains. Excellent results can now be achieved by applying selected rodenticides directly to tree seed.

Fire Prevention Saves Northwest from Serious Year

Forest fire prevention and suppression has progressed tremendously. If it hadn't 1958 would surely have been a "big burn" year in the Pacific Northwest. Fire weather observers report it as the most dangerous forest fire conditions of the area's history. Low humidities—frequently dropping below 30%, the minimum for continuing woods operations in the Douglas fir region, dry weather and high temperatures over extended periods created grave forest conditions.

That no large conflagration occurred was no accident. Instead it resulted from a concerted program of many years.

Wisconsin's Use of Home Grown Wood Increasing

The Wisconsin paper industry is meeting the challenge of rising costs by increased use of hardwood pulpwood and encouraging reforestation and forest management to localize pulpwood procurement.

These were two of the economic factors bearing on the growth of the industry in Wisconsin cited by M. N. Taylor, executive director of Trees for Tomorrow, Inc., before a group of paper industry personnel attending the Institute of Paper Chemistry's third industry seminar.

Mr. Taylor said, "Wisconsin mills are looking to local sources to ease the burden of an annual \$25 to \$30 million pulpwood import bill. Since 1948 the consumption of "home grown" pulpwood has climbed from 27 to 42 per cent of total consumption and is expected to reach 80 per cent in the not-too-distant future."

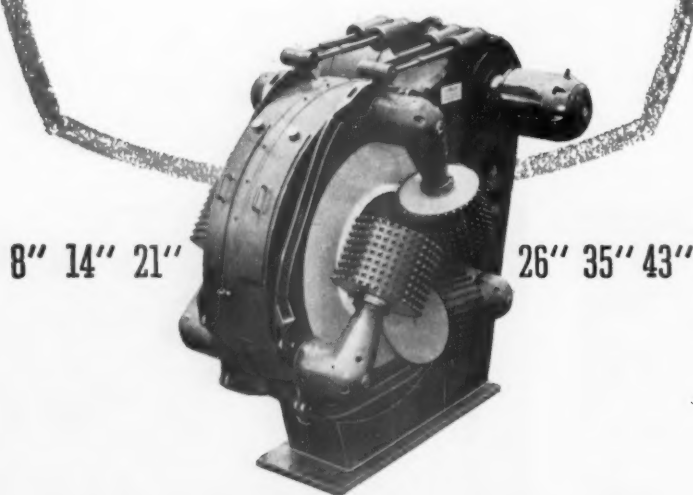
Taylor, who spoke to the group at the Trees for Tomorrow camp at Eagle River, Wis., also pointed out that Wisconsin mills are utilizing far greater quantities of less expensive and more readily obtainable hardwood pulpwood. "Wisconsin mills now consume half of the aspen and one-sixth of the total national hardwood pulpwood consumption."

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Debarkers Extend Cutting Season

for Ontario Paper Co. and also reduce labor costs. Four types of machines being used are described in this article

● The introduction of mechanical debarking in the woods has extended Ontario Paper Co. Ltd.'s production season while at the same time substantially reducing labor requirements and costs.

During the 1958 cutting period—from April to December—the firm carried out the mechanical debarking of more than 23,000 rough cords of pulpwood. In general, the operation was centered on main woods or in yards as close to the stump as possible. The machines used included the Cambio 35, the Tampella Mark II, the Bark-Lasse and the Canadian Ingersoll-Rand.

Prior to the introduction of mechanical debarking, delivery of rail wood to the mill at Thorold, Ont., was limited to sap-peeled logs in distances of from 200 to 500 miles. The controlling factor was shipping weights. Under the best circumstances machine-peeled wood of satisfactory cleanliness has been produced for the same cost as sap-peeled wood and at a much lower cost than rough wood landed at the mill.

Commenting on his firm's experience, R. D. Prince, supt. of wood purchases, Thorold, Ont., had this to say: "A great deal of interest has been expressed by pulpwood producers in our debarking operations conducted in 1958, and our 1959 plans called for an increased quantity of machine-peeled pulpwood."

Mr. Prince describes for PULP & PAPER the operation of the debarking equipment used during the past year in the woodlands of Ontario Paper.

The Cambio 35

Two Cambio 35s were in operation. One on Manitoulin Island debarked poplar, while a unit operating in northern and southern Ontario debarked spruce, balsam, jackpine and pine thinnings.

The Cambio, manufactured by Soderhamn Machine Mfg. Co., is described as "the most satisfactory machine from the point of view of production and costs." Production on poplar has varied from 7 to 10 rough cords per hour depending on the average diameter of the wood, while spruce and balsam production ranged from 5 to 7 cords hourly, again depending on the average diameter.

"Cost per cord of debarking—including depreciation—varied from \$3.25 to \$4.50 per peeled cord depending on operating conditions and wood species," Mr. Prince continues: "Cleanliness was satisfactory on both green and air-dry wood."

Capital cost of the mechanically-driven mobile unit is about \$18,000 complete with second-hand truck. For an electrically-driven unit complete with power source the capital cost runs to about \$25,000.

The Tampella Mark II

Built in Canada to Canadian standards, the Tampella Mark II debarker is a 6-ton unit mounted on four tires. It is mobile but not self-propelled. Whereas the Cambio depends on rubber tension for tool pressure, the Tampella is equipped with counterweights applying pressure by centrifugal force. It is an electrically-driven machine with an aperture of 17½ in.; the aperture of the Cambio is 14 in.

The Tampella accepts wood 16 in. in diameter, whereas experience has shown the Cambio to accept wood of no more than 11 in. The feed speed of the Tampella is 75 lineal fpm, while "our Cambio," according to Mr. Prince, "operated at mostly 85 to 90 fpm." The machine handles only 8-ft. wood whereas the Cambio 14 handles 4-ft. sticks. (The larger Cambio is not yet designed for 4-ft. wood.)

The hourly operating cost of the Tampella Mark II, including all wood

handling, approximates \$20.00, and production of peeled wood averaged an hourly 4 to 5 cords.

Manufacture of the Tampella Mark II has been recently taken over by Black-Clawson Co. B-C plans certain design changes, and it is anticipated that the unit will show an improved performance in 1959 trials. It is a larger, heavier and stronger machine than the Cambio, according to Mr. Prince, and with the contemplated improvements should be relatively free of maintenance costs.

Capital cost of the complete set-up—including power unit, conveyors and slasher—is about \$40,000.

The Bark-Lasse Debarker

This small portable machine rides on two rubber-tired wheels and can be towed behind a small tractor and operated from the power take-off.

The Bark-Lasse is a low-production machine operated by two men. The maximum production obtained by Ontario Paper, according to Mr. Prince, was 1.5 cords per hour. Debarking costs were approximately \$5.00 to \$6.00 per cord. This included charges for the power towing unit.

Mr. Prince continues: "This machine is satisfactory for the small license holder or the farmer who wants to peel his wood."

The Bark-Lasse debarker is manufactured by Skogsberg and Larsson in Sweden; distributed by Robert Walby Ltd., 4805 Cumberland Ave., Mon-



CAMBIO 35 . . . of type used in Ontario Paper Co. woods.



TAMPELLA MARK II . . . seen from discharge end. Note peeled logs at left.

treel 29, Que. Cost of the Bark-Lasse unit alone is approximately \$1,800.

The Canadian Ingersoll-Rand

Still a prototype machine undergoing trials is the debarker being manufactured by Canadian Ingersoll-Rand Co. Ltd. It is mounted on a jeep 4 x 4 truck.

The Canadian Ingersoll-Rand unit "has demonstrated good compactness of design, extreme mobility . . . and has shown a production of from 5 to 6 rough cords per hour on extremely small diameter wood. Debarking cleanliness is satisfactory, and the machine shows good promise. However," Mr. Prince finds, "there

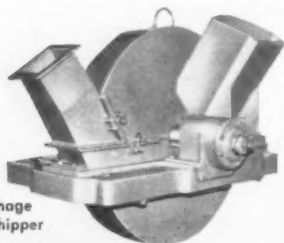
are improvements and adjustments necessary before the unit can be declared a production machine. But, its development is well worth watching."

Yale Forestry Seminars Set in New Haven and Crossett

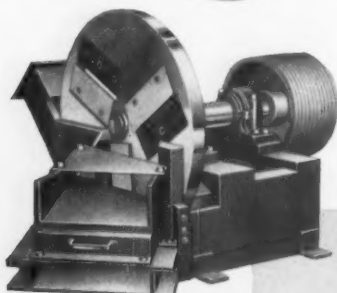
The 11th Industrial Forestry Seminar of Yale School of Forestry will be held at New Haven, Conn., Apr. 6-17, and pulp and paper companies are invited to nominate candidates. It is expected that men nominated for enrollment will have had a minimum of five years of the type of experience which should qualify them for active participation in the discussions. Applications are required no later than Feb. 2, 1959.

Enrollment will be limited to approximately 20 people. The tuition charge is \$200 per person. Registration will take place in Room 31, School of Forestry, New Haven, 8.30 a.m., Apr. 6. Living expenses will be borne by students or employers.

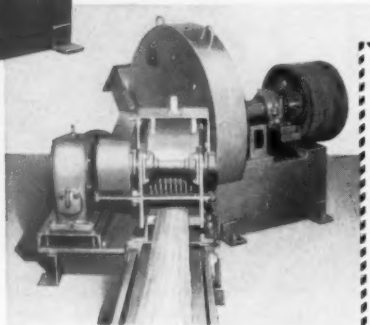
The 10th session in the Yale Industrial Forestry Seminar series will be held in Crossett, Ark. Mar. 2-13, in cooperation with The Crossett Co. Forest industries and consulting foresters are invited to nominate candidates. Enrollment will be limited to approximately 20 people.



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**SPCA Starts Forest Program
To Help Small Landowners**

The Pilot Forest Program, one of the most intensive forest development programs for small woodlands ever undertaken in the South, has been mapped by the Southern Pulpwood Conservation Assn.

Under the program, some 100 permanent educational forest tracts in 12 Southern states will be set up to encourage small landowners to grow more trees. It is expected not only to help small landowners but also bring broader public understanding of the industry to the South.

State chairmen for this project include F. C. Gragg, International Paper Co., at Camden, Ark., *Arkansas*; D. V. Logan of International Paper Co., Natchez, Miss., *Mississippi*; Frank Heyward, Jr., Gaylord Container Corp., Bogalusa, La., *Louisiana*; J. H. Johnson, Chesapeake Corp., West Point, Va., *Virginia*; Dr. C. E. Hartford, Riegel Paper Corp., Acme, N.C., *North Carolina*; Cam Neiderhof, West Virginia Pulp & Paper Co., Charleston, S.C., *South Carolina*; Stephen Chase, Jr., Champion Paper & Fibre, Pasadena, Tex., *Texas*; T. Marshall Courtney, Buckeye Cellulose Corp., Foley, *Florida*; Ed Stout, Bowaters Southern Paper Corp., Calhoun, Tenn., *Tennessee*; Kirk Sutlive, Union Bag-Camp Paper Corp., Savannah, Ga., *Georgia*; R. Vance Miles, Jr., Gulf States Paper Corp., Tuscaloosa, Ala., *Alabama*.

**Industry Forms Nationwide
Pest Control Committee**

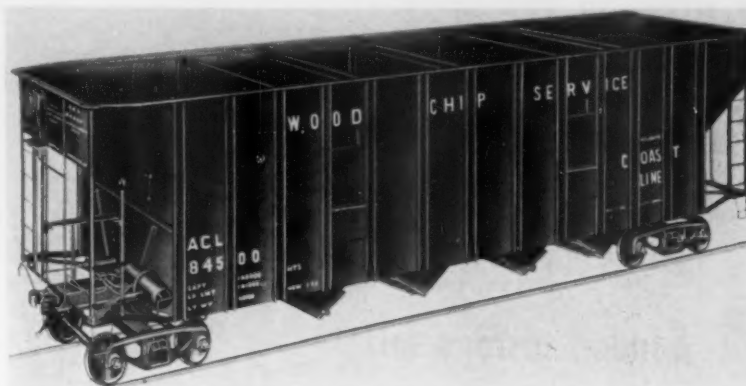
The Forest Industries Council has established a special committee for control of forest insects and diseases on nearly a half-billion acres of commercial timberlands in the U.S. Membership of the council, a top-echelon forest policy body, consists of representatives of major industrial forestry groups such as American Paper & Pulp Assn., American Pulpwood Assn. and National Lumber Mfrs. Assn.

According to FIC Chairman James Madden, vice pres. of Scott Paper Co., formation of this committee gives the forest industries more unification in planning and coordinating public and private programs on forest pest control problems. He says insect and disease damage in forests of this country have mounted during recent years to the current rate of about 7 billion

bd. ft. per year—about nine times that from forest fires. Accelerated salvage on stricken areas serves to reduce losses sustained from all three of these causes.

Objectives of the pest-control com-

mittee: To achieve better understanding, coordination and cooperation among all agencies concerned with forest pest control; facilitate forest pest surveys throughout U.S. and suggest appropriate control measures; stimulate interest and action of pest control as integral part of forest management and protection; encourage formation of regional and state pest action committees where none exist and need is clearly demonstrated.



Wood Chip Boom Spurs Giant Chip Cars

Two hundred open top hopper cars to serve paper mills in the Southeast are being built by Atlantic Coast Line Railroad. Working closely with this industry, ACL has tailored these new design cars to meet the spurt in demand for wood chips which has grown from 76,000 cords in 1953 to 1,203,000 in 1957. This is about 6% of total pulpwood production in the United States.

The giant-sized cars are 15-ft. high, 50-ft. long and have a capacity of 5,400 cu. ft., about twice that of conventional cars. This means a substantial saving in loading, unloading and switching time, as each car will handle the equivalent of 28 to 30 units of wood chips weighing 70 tons. Car interiors will be coated with an acrylic type paint to prevent corrosion and provide a slippery surface for unloading.



Weight Scaling of Hardwoods in Northeast is Successful

This is what Ed C. Melcher, woodlands mgr., S.D. Warren Co., told American Pulpwood Assn. Lake States meeting (story in January Pulpwood Section of PULP & PAPER). These inside and outside pictures show set-up at Cumberland Mills in Maine. Warren installed a set of Toledo scales called "Print Weight," 10 by 15 ft. with capacity of 100,000 lbs. Weight is printed automatically on a slip. Scale has dual face so trucker can read it. He is paid once a week, and likes the system. The mill reports getting better quality wood and more green wood. About 80% is fresh cut.

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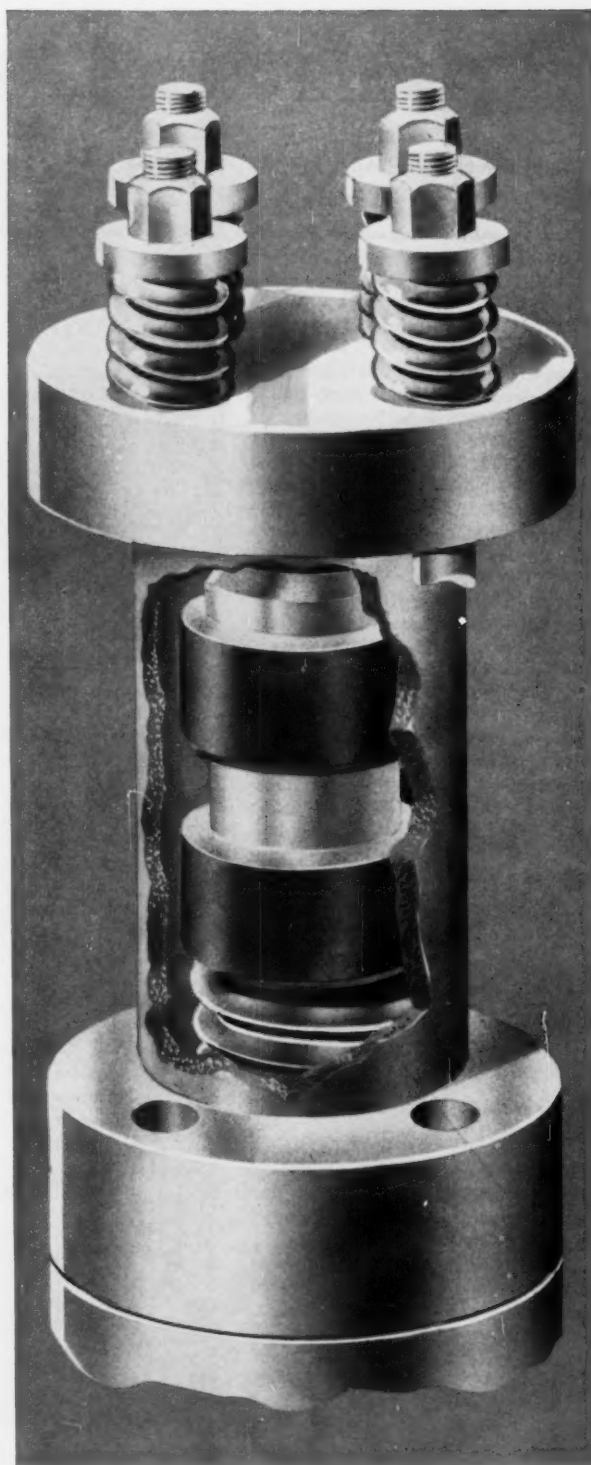
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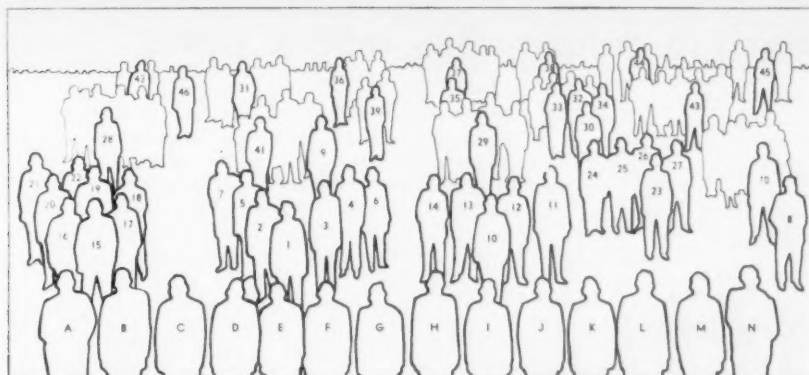
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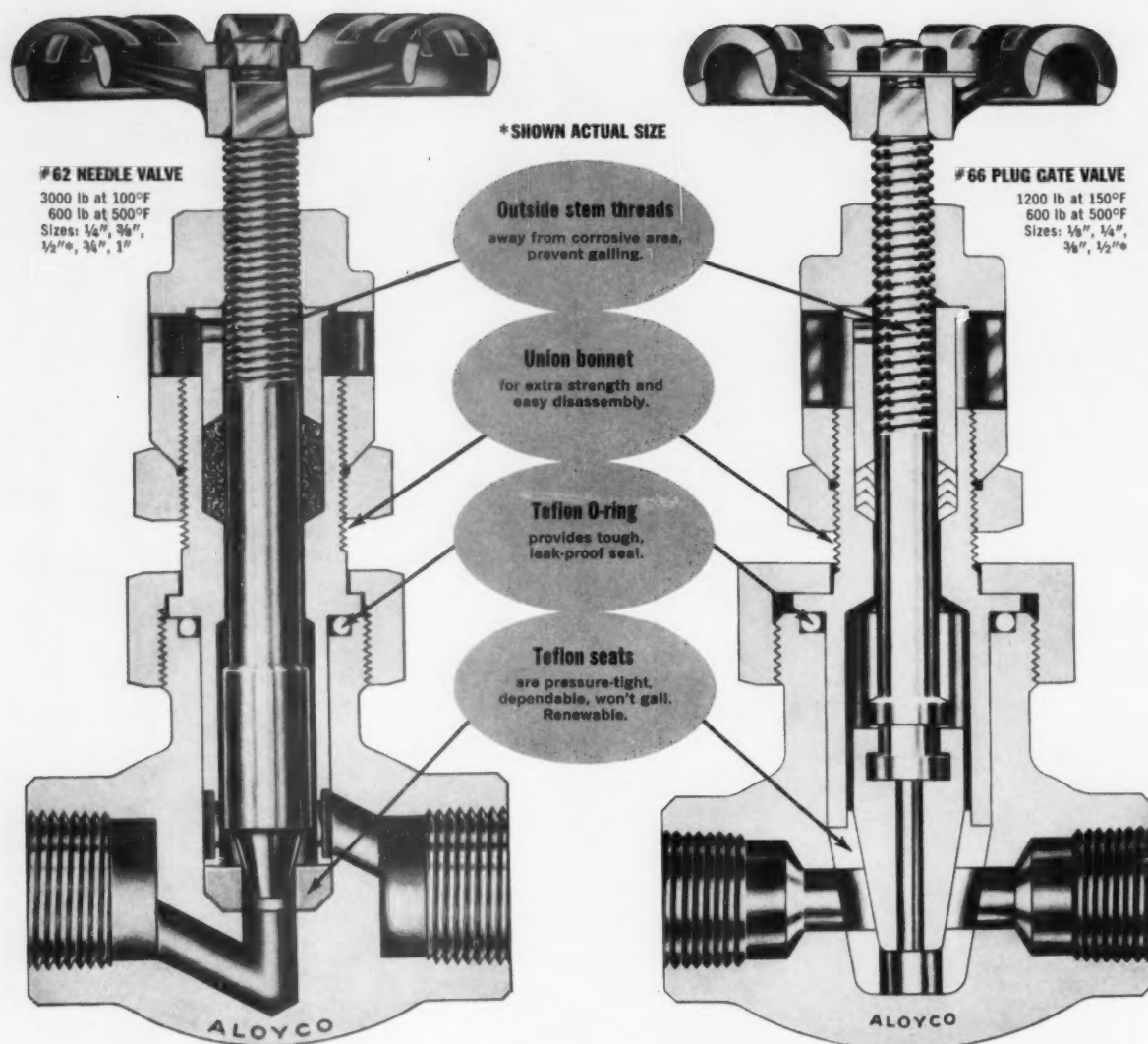
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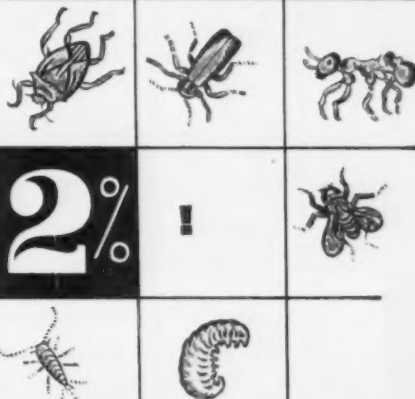
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811 Rusk Avenue, Houston 2, Texas

How RYKON GREASE

has performed in seven tough applications

In just two years since introduction, **RYKON** Grease has stepped in to deliver lubrication in hundreds of applications where other greases have failed

In the process industries where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new

type of grease has been needed. RYKON is that grease. Here are just seven examples of how RYKON Grease has performed in tough spots:

| Industry | Equipment | Type of Bearings | Conditions | Remarks |
|-----------------------|-----------------------------|-------------------------|-----------------------------------|---|
| Packing Company | can closers | various | high temperature, heavy load, wet | Outperforms previously used greases. |
| Brewery | washers, conveyors | various | high temperature, wet | Lasts longer and does a far better job on all applications. |
| Packing Company | canning machines | plain and anti-friction | wet | Very satisfactory. |
| Chemical Laboratory | washers and degreasers | anti-friction | wet | Better than any grease tested in degreasing solvent. |
| Automotive Parts Mfr. | reciprocating pump bearings | plain | wet | Pumping chemicals. O.K. after one month. Previous grease caused about one bearing failure per week. |
| Paper Mfr. | liquid sulfur pump | anti-friction | high temperature, wet | Has extended life of bearings. |
| Paper Carton Mfr. | all grease-lubricated parts | various | high temperature, heavy load, wet | Replaced eight different greases. Stays in better. |

The reason RYKON Grease can perform under conditions that cause other greases to fail is this: RYKON Grease has a unique non-soap, organic thickener. This thickener holds the oil between its fibers better than any other gelling agent. The thickener is able to withstand extremely high as well as low temperatures. It resists chemical action and remains stable under conditions of severe working and water washing. RYKON Grease has exceptional anti-rust properties.

RYKON Grease's unique properties make it truly multi-purpose. This leads to many

worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated and maintenance training and supervisory follow-up is greatly reduced.

More facts about RYKON Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

You expect more from



and you get it!

Oven test shows high temperature performance of RYKON Grease. 1. Metal panel coated with RYKON and placed in oven at 350° F. 2. Same panel after five days. RYKON is still soft and ready to lubricate. 3. Another high-melt grease ready for same test. 4. Same panel after oven test. Grease has failed completely.



For more than 30 years, the Sonoco laboratory has studied, developed, tested and controlled the production of Sonoco paper mill cores. Completely integrated manufacturing facilities, from pulp to finished product, together with vast experience in building a wide range of paper carriers for industrial uses, has resulted in the superior quality of Sonoco paper mill cores. It is in these qualities of ultra-high torque and crush strength, plus the all important factor of uniformity, that produces the ultimate in cost savings in their end use.

DUROLENE CORES: Premium Sonoco quality. Available as a non-returnable core in all diameters and lengths, or returnable with Bermico metal ends in standard sizes.

DURO CORES: Standard Sonoco quality. Available with or without Bermico metal ends.

Both Durolene and Duro cores guarantee close tolerances to all dimensions.

Specialty cores, from 1/4" I.D. and up, in lengths to 24'. Supplied in colored stock or with special inside or outside wrap, plain or printed.

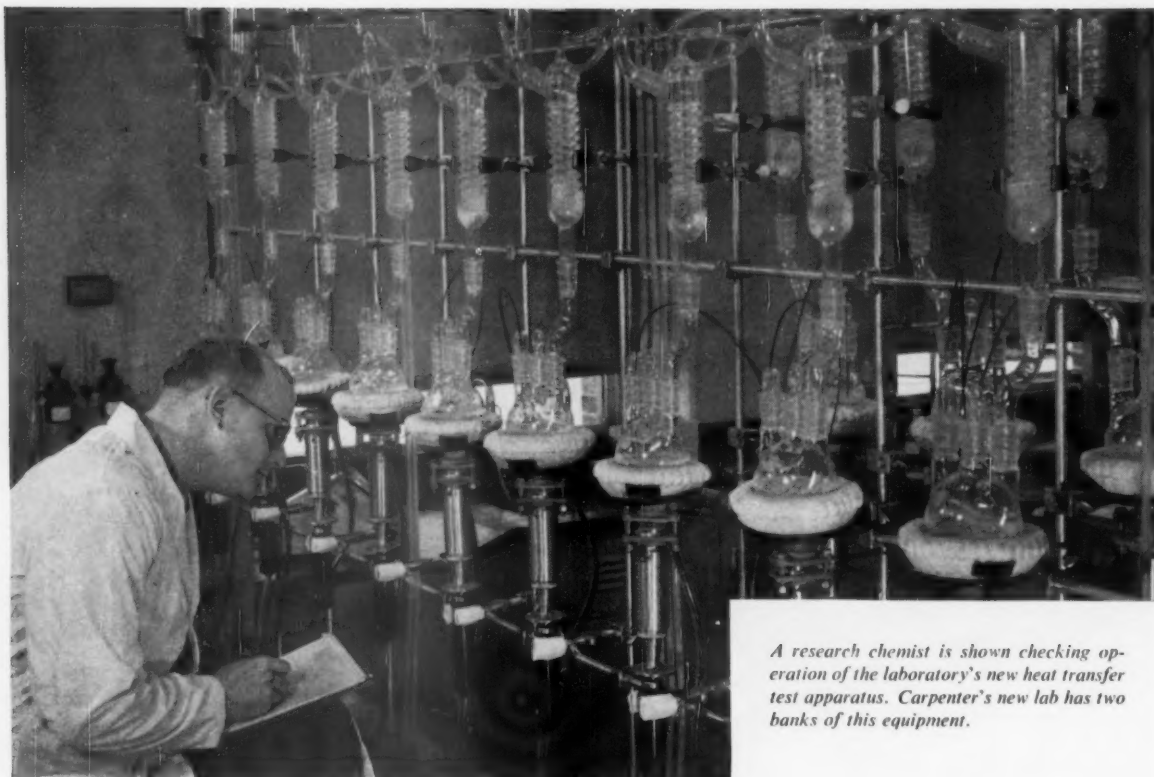
SONOCO



Paper Mill Cores

SONOCO PRODUCTS COMPANY

Main Office — HARTSVILLE, S. C. • MYSTIC, CONN. • AKRON, IND. • LOWELL, MASS. • PHILLIPSBURG, N. J. • LONGVIEW, TEXAS • PHILADELPHIA, PA. 1964
• LA PUENTE, CALIF. • ATLANTA, GA. • GRANBY, QUEBEC • BRANTFORD, ONTARIO • MEXICO, D. F.



A research chemist is shown checking operation of the laboratory's new heat transfer test apparatus. Carpenter's new lab has two banks of this equipment.

Carpenter's new corrosion laboratory can predict stainless tubing performance on your job



A corrosion engineer makes final adjustments on the new Corrosometer.



This new electro-chemical equipment enables Carpenter to make more thorough study of the behavior of stainless steels and thus gather more background for the development of new and improved alloys.

This new laboratory is considered the largest and best equipped of its kind among companies producing specialty steel exclusively. Heat transfer apparatus, Corrosometer, multi-sample tester, electro-chemical equipment, high pressure, elevated temperature corrosion testing, and stress corrosion cracking equipment give Carpenter the facilities to help solve your corrosion problems and select the right material for any of your needs. Carpenter . . . first in corrosion research . . . first in corrosion control . . . first in stainless tubing and pipe economy. Authorized distributors in over 40 cities, coast to coast. Or write to The Carpenter Steel Company, Alloy Tube Division, Union, N.J.

*your master key
to cost-saving
corrosion control*



Stainless Tubing & Pipe

Perfect control from pine to pulp

As with every other product, there are short cuts possible in the manufacture of wood pulp. Buckeye avoids them. Rigid quality controls are maintained for every stage from forest to finished product.

These controls start with the most careful supervision of planting and harvesting of our 800,000 acre tree farm in Florida. As selected logs are converted into wood pulp by advanced processes, there are constant checks and double-checks. And before final approval for shipment, Buckeye Pulp must pass exacting laboratory tests to be sure it meets every specification.

This perfect control from pine to pulp means customer satisfaction. If you want a reliable source of bleached or semi-bleached kraft . . . of uniformly high quality . . . get in touch with Buckeye.

Address inquiries to:

BUCKEYE CELLULOSE CORPORATION, MEMPHIS 8, TENN.

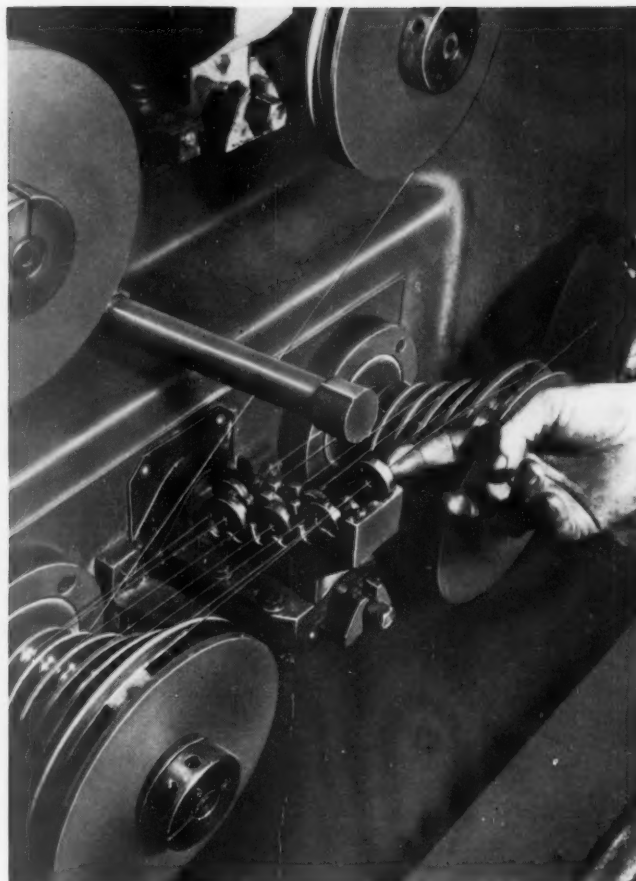
Wood Pulp Plant at Foley, Florida

Cotton Linters Pulp Plant at Memphis, Tennessee



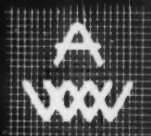
Buckeye Pulp

Bleached and Semi-Bleached Kraft from Southern Pine



This is the business end of one of Appleton's 30 drawing machines. Through tungsten carbide and diamond dies, wire is drawn out with micrometric precision . . . to a hairlike fineness. The greater resistance to abrasion and the added strength of Appleton's Fourdrinier wires pay-off in profitable performance on *your* paper machine . . . another reason why Appleton wires are good wires.

Troubled by wire mark in your printing papers? Appleton's *Monoplane* and *Flatwarp* weaves may be your answer. Ask your AWW representative how these special wires can help solve your wire mark problem.



APPLETON WIRES ARE GOOD WIRES

Appleton Wire Works, Inc. • Plants at Appleton, Wis. and Montgomery, Ala. • International Wire Works, Menasha, Wis.

South

The Southern Exposure: K. O. ELDERKIN, president of Bowaters Research & Development Inc., Calhoun, Tenn., and former president of TAPPI (1955 and 1956), will receive the 27th annual TAPPI Gold Medal during Paper Week. Making the presentation at the Commodore Hotel in New York, N. Y., will be GUNNAR NICHOLSON, president of Tennessee River Paper Mills Inc.

New names at St. Francisville Paper Co.: Latest additions to the Crown Zellerbach Corp.-Time Inc. mill at St. Francisville, La., include RALPH SIEVERS, 25-year CZ veteran who will be steam plant supervisor, and THOMAS R. TYRELL, who is sheet finishing supervisor. . . . DALE FISHER, formerly asst., is now supervisor of production planning and shipping at CZ's multiwall bag plant at Bogalusa, La.

ARTHUR LOEB, asst. mgr. at Olin Mathieson Chemical Corp.'s Ecusta Paper div. in Pisgah Forest, N. C., is new chairman of the advisory council, North Carolina State College school of engineering. . . . JOHN A. BOUSQUET, formerly south Texas regional mgr., is now southwestern regional mgr. at the Houston box plant of Gaylord Container Corp. Promoted to mgr. of the Dallas box plant is LLOYD MERWIN JR. . . .

JOHN MALLORY of Union Bag-Camp Paper Corp. at Savannah, Ga., has won second place in the Southeastern TAPPI technical report contest. . . . JACK WARNER, president of Gulf States Paper Corp., has been elected president of the Alabama State Chamber of Commerce.

Short Snorters: ERNEST WILLIAMS, new member of the board of Gulf States Paper, is vice pres. of finance and treas. of the firm. The other newly elected



New Man For Bauer

CARL HENDRICKS, familiar to many Southerners, has joined the staff of Bauer Bros. as a member of its Southern sales staff. Mr. Hendricks will travel out of Brevard, N.C. He is a member of TAPPI and the Superintendent's Assoc.



W. W. Stuart, Res. Mgr., Palatka Mill

Mr. Stuart, vice president, Hudson Pulp & Paper Co., is a graduate of Harvard U. with his master's in b.a. business administration, his b.s. from Carnegie Institute of Technology. He joined Hudson in Jan. 1958 as executive assist. for operations in the New York offices, later became resident mgr. at Palatka, Fla. His previous experience was with West Virginia Pulp and Paper Co.

director is ROBERT H. FLATO, grandson of one of Gulf States' founders and president of Chambers Stove Corp. . . . CHARLES CAMPBELL, formerly at Coosa River Newsprint Co., is now project engineer for Kimberly-Clark Corp. at Neenah, Wis. . . . DAVE JOHNSON is on the engineering staff, mill div., Owens-Illinois Glass Co., Valdosta, Ga. He was formerly engineer at the Tomahawk, Wis. mill. . . . IVAN LESTER, formerly with Georgia Kaolin Co., is technical director, Mead-Atlanta Paper Co., Atlanta, Ga. . . . JOSEPH KULIUS, onetime staffer at Wausau Paper Mills Co., is administrative engineer for Gulf States Paper Corp. EARL S. MOAK, formerly with Scott Paper Co.'s Hollingsworth & Whitney div. in Mobile, Ala., succeeds the late BOB WILLIAMS as paper mill supt. at the Naheola, Ala., mill, Marathon Southern Corp. JOHN FULKERSON is asst. supt.

Bowaters Southern Paper Corp. is sponsoring a special educational project for gifted science students. Fifty top scholars from the local high school have been selected and enrolled in a seminar that meets two hours every Monday night. Top technical people from the Bowaters staff and others conduct discussions. Coordinator is SAM RICHARDSON of the Bowaters technical service dept.

E. D. HOEKSTRA, for 12 years with H. K. Ferguson Co., has joined Mid-Valley Utility Constructors Inc., Houston, Texas, as mgr. of industrial and public relations.

HOWARD W. EDMISTER has been given a southeastern sales territory by John W. Bolton & Sons Inc. and the Emerson Mfg. Co. div., Lawrence, Mass. He was chief

Dictionary of Pulp and Papermaking Terms

By Curtis L. Brown

Blow pit—Band's brass section
Dimensional analysis—"36, 24, 36—wow!"
Plant management—Watering the flowers
Recovery plant—Beauty parlor
Refining—Studying Emily Post
Vacuum roll—Doughnut
Wrinkle coating—Foundation cream + powder + rouge

production engineer for High Voltage Engineering Co. . . . JOHN LUDDEN JR. is now asst. mgr. of American Cyanamid Co.'s pigment div. plant in Savannah, Ga. . . . Taylor Machine Works, Louisville, Miss., has appointed PAUL YOUNGER industrial sales representative in Alabama and eastern Tennessee. . . . Dillon Supply Co. of Raleigh, N. C., is distributing Summer Iron Works chipping and waste-wood equipment in Virginia, North Carolina and northern South Carolina. . . . Allan Edwards Inc. has been named industrial sales rep. for Warren Pumps Inc. Allan Edwards has offices at 2445 S. Jackson St., Tulsa, and at 4942 Greenville Ave., Dallas.

PAUL E. GARTMAN is new scheduling supervisor for Gulf States Paper Corp.'s planning div. He joined the firm early last year. . . . T. H. CALDWELL JR. is mgr. of Dow Chemical Co.'s new office in the Wachovia Bank Bldg., Charlotte, N. C. He was formerly mgr. of automotive chemicals sales.

Midwest

L. W. SUTHERLAND SR. has retired as board chmn. of Sutherland Paper Co., Kalamazoo, Mich. He remains a member of the board and chmn. of the exec. committee. WILLIAM RACE, formerly president, succeeds Mr. Sutherland. Becoming president is E. WENDELL SMITH, secy.-treas.

The Northwest Paper Co. of Cloquet, Minn., has reported election of CLARENCE P. SHELDON as vice pres. and his appointment as gen. sales mgr. Appointed mgr. of marketing was BERNARD W. McEACHERN, vice pres. GLENN J. AYRES is asst. secy.

ROY L. CRAMER JR. has been appointed dist. mgr. of Clinton Corn Processing Co.'s new office in St. Louis. For 11 years he has been in the Kansas City district.

GOWAN J. MILLER assumes the newly created position of personnel director at the Institute of Paper Chemistry, Apple-

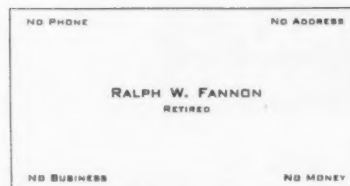
ton, Wis. He was formerly with Automatic Control Co., St. Paul, Minn.

LOWELL SCHLEICHER, head of the fundamental research dept. of National Cash Register Co., Dayton, O., addressed the Dec. 9 meeting of Ohio TAPPI. Speaking in "The N. C. R. Paper Story," Mr. Schleicher stressed development of capsular structures in conjunction with the No-Carbon-Required paper produced by National Cash Register. He demonstrated diverse applications of the capsular development in the pharmaceutical, foodstuff and fuel fields.

SPEED WARREN, 88, former director and vice pres. of The Mead Corp., died recently at Dayton. He had been active

with the firm in a consulting capacity. Mr. Warren began his industry career about 1896 at Sault Ste. Marie, Ont. He joined Lake Superior Paper Co. in 1911 and in 1917 moved to Dayton to join G. H. Mead Co. In 1919 he was named treas. of Mead Pulp & Paper Co. and was elected a vice pres. in 1942. Mr. Warren was semi-retired in 1951.

H. SCHUYLER COLE assumes the new position of vice pres. for paper products for Procter & Gamble Co. He was vice pres. of the toilet goods div. since 1956 and since early 1957 has been responsible for the management of the paper products div. Succeeding Mr. Cole is CHARLES M. FULLGRAF, associate mgr.



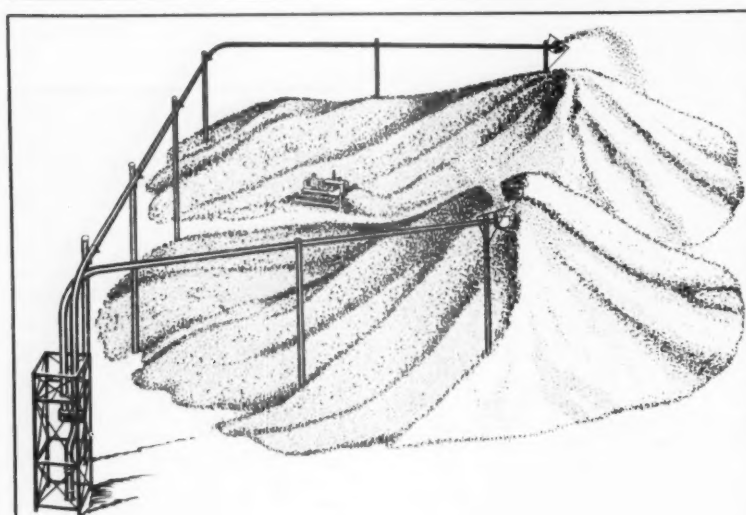
RALPH W. FANNON used to be pulp sales chief for Marathon until his recent retirement, when he was succeeded by HAROLD SKINNER. But don't take this new "personal card" of his too seriously. Last heard from, he was working on a special consulting assignment, "just to prove to himself he could," says his wife, WILMA. But they are either going to buy or build a new home at La Jolla, Calif., and in due course will quit their Wausau, Wis., home for good. Meanwhile they send regards to old friends at Paper Week.

of the div. since early 1957.

C. H. BUTTERFIELD has joined Pusey & Jones Corp. as a sales rep. in the Midwest. He began his paper industry career at an Ohio mill in 1917 and since 1947 has been associated with several paper machinery makers.

Champion Paper and Fibre Co., Hamilton, O., reports the appointment of Maj. GEN. ALFRED H. JOHNSON (USAF, Ret.) as special asst. to HENRY W. RUGBY, exec. vice pres. for corporate development. While in the armed forces he was primarily concerned with problems of production, engineering, procurement and administration.

DAVID GULLETTE is sales supervisor in the chemical dept. of A. E. Staley Mfg. Co., Decatur, Ill. He was formerly asst. mgr. of the export div. and succeeds FRANK JAMES, recently transferred to Pittsburgh.



WALDORF PULP AND PAPER COMPANY SELECTS RADER PNEUMATIC CONVEYORS

This Rader Pneumatic conveying system receives chips from a truck and rail car unloading pit. Chips are currently being blown through two ports of a four-way valve to outside storage. The other two ports will eventually be used to bypass outside storage and blow directly to a conveyor going to the pulp mill. These 10" lines convey 60 tons of chips per hour for a distance of 500 feet.

Simple pole supports eliminate costly suspension structures required with old-fashioned conveyors, and with pneumatic conveying systems there are no moving parts to break or clog.

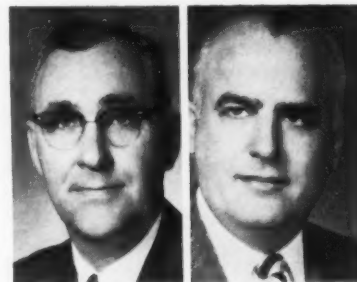
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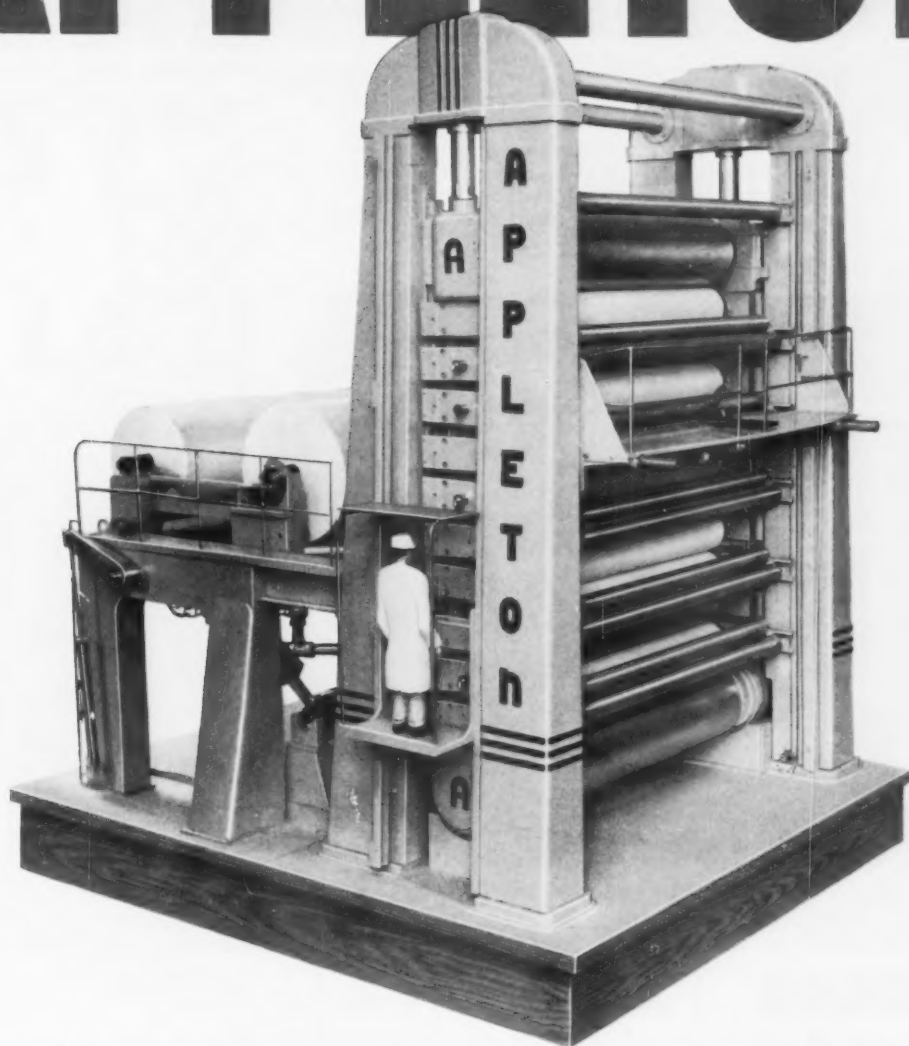


Brown Csellak

New Gardner Vice Presidents

DUNCAN S. BROWN and WILLIAM R. CSELLAK have been named vice presidents at the Gardner div. of Diamond Gardner Corp., Middletown, O. Mr. Brown, formerly mgr. of manufacturing-paperboard, becomes vice pres. of manufacturing-paperboard. Mr. Csellak, mgr. of manufacturing-cartons, becomes vice pres. of manufacturing-cartons. Mr. Brown, at one time gen. supt. at the Lockland mill, is responsible for paperboard manufacture at the division's three mills in Middletown and Lockland. Mr. Csellak, a graduate of the Institute of Paper Chemistry, has charge of carton and retail box manufacture at Middletown and Lockland fabricating plants.

APPLETON



This is a model of Appleton's new high-speed supercalender. For the first time in the industry, Appleton has combined the advantages of a 4-column supercalender with the roll removal features of an open-face stack. At the same time, this revolutionary Appleton design eliminates many of the difficulties inherent in an open-face stack — couching of rolls, necessity of dismantling auxiliary rolls to change filled rolls. **NEW APPLETON HIGH-SPEED SUPERCALENDER FEATURES:** In addition to the many advanced features standard on all Appleton stacks, this new high-speed supercalender has: **All parts easily accessible by lifts and elevators . . . Filled rolls removed from back of stack onto full length elevators . . . Unwind with semi-automatic parent roll handling and empty spool transfer to windup . . . Windup with semi-automatic spool handling and wound roll transfer . . . Calender roll housings maintained in vertical alignment by four columns . . . Housings equipped with retractable ball-bearing casters riding in ways . . .** Perhaps this new Appleton supercalender can prove profitable to your operation. We invite you to write for complete technical data. **ON DISPLAY IN THE APPLETON BOOTH AT THE TAPPI MEETING.**

APPLETON MACHINE COMPANY

APPLETON, WISCONSIN



PULP & PAPER

Strictly Personal

The Mead corp. reports the promotion of three members of the research dept.: DR. E. S. FLINN, asst. director of chemical research, becomes asst. to the pres. of Hurlbut Paper Co., South Lee, Mass. (a wholly owned Mead subsidiary); HENRY G. CALDWELL, group mgr. for pulping and bleaching, succeeds Dr. Flinn, and KARL W. MESCHKE, a chemist in the Chillicothe research dept., assumes the duties of Mr. Caldwell. . . . In another Mead promotion, W. H.

HILDEBRAND becomes asst. director of wood procurement. For the past five years he has been northern wood procurement mgr.—Don W. Zeigler.

Clarence L. Durkee Dies

Clarence L. Durkee, for many years prominent inventor of new pulping processes and participant in many significant technical advances, died Jan. 7 at the Shawnee Hotel, Springfield, O. He was 58.

Mr. Durkee passed away at the hotel where he maintained residence while engaged in design and sales of the Bauer Bros. Co. continuous digester. He was at one time with D. J. Murray Mfg. Co., Wausau, Wis. His home was in the Wisconsin city.

The body was returned to Wausau for burial. Mr. Durkee is survived by his wife, Marie, and one daughter.



Marx Rye

Wausau Paper Mills Promotions

The Brokaw, Wis., mills report appointment of DAVID E. MARX as Cleveland dist. sales mgr. Following sales assignments with Thumb Merchandising Co. and Port Huron Sulphite & Paper Co., he joined Wausau Paper Mills and since 1953 has been representing the firm in the southern territory.

At the same time it was announced that JOSEPH H. RYE will serve as western dist. sales mgr. He joined Wausau Paper Mills in 1954 as West Coast rep. after service with International Paper Co. and Lewis-Brownville Sales Inc.

Northeast

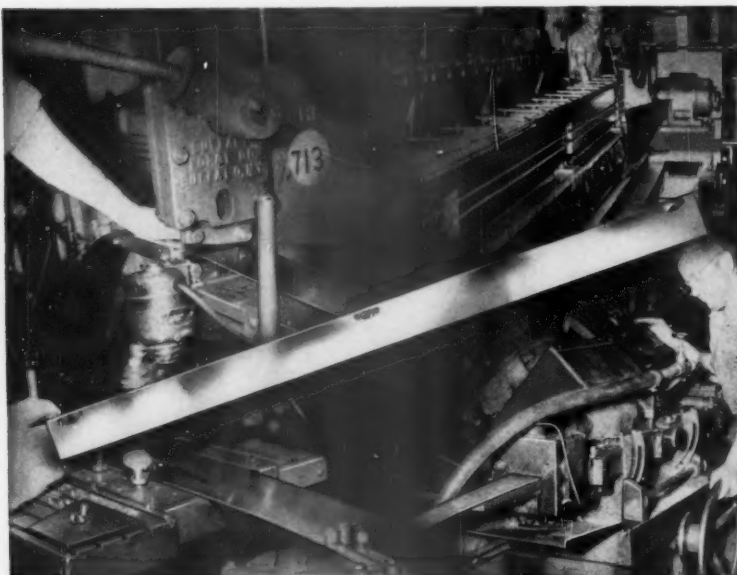
A. J. STRAUSS steps into new post of director of purchases, Riegel Paper Corp., reporting to R. L. KERRIDGE, vice pres. His office continues at Milford, N.J. HARRY L. SINGLEY, asst. p.a., takes over in overall administration of purchasing for New Jersey divisions.

CHARLES H. DAY is now mfg. mgr. for paper container division of Continental Can Co., replacing GEORGE H. BARKER, named mgr. of paper container's new plant in Three Rivers, Mich. GEORGE S. JOHNSTON JR., previous mgr. of Three Rivers plant, has been transferred to Robert Gair paper products group as mgr. of bleached paper development.

JOHN W. LUSK JR., has been named senior sales rep in Philadelphia area for A. E. Staley Mfg. Co.; EDGAR J. VAN-ALLSBURG joins industrial sales as technical supervisor in New York. . . . DR. J. H. PADEN, director of American Cyanamid's Bound Brook labs, has been named director of research for organic chemicals div.

TED E. DETCHER, formerly vice pres., Chemical Linings, Inc.; has resigned. . . . AL FORSYTH, 40-year veteran with Bird Machine as service engineer, has retired. . . . GORDON F. RYAN is now sales rep for Cooper Alloy in New Jersey.

ARTHUR PHILLIPS JR., is appointed vice



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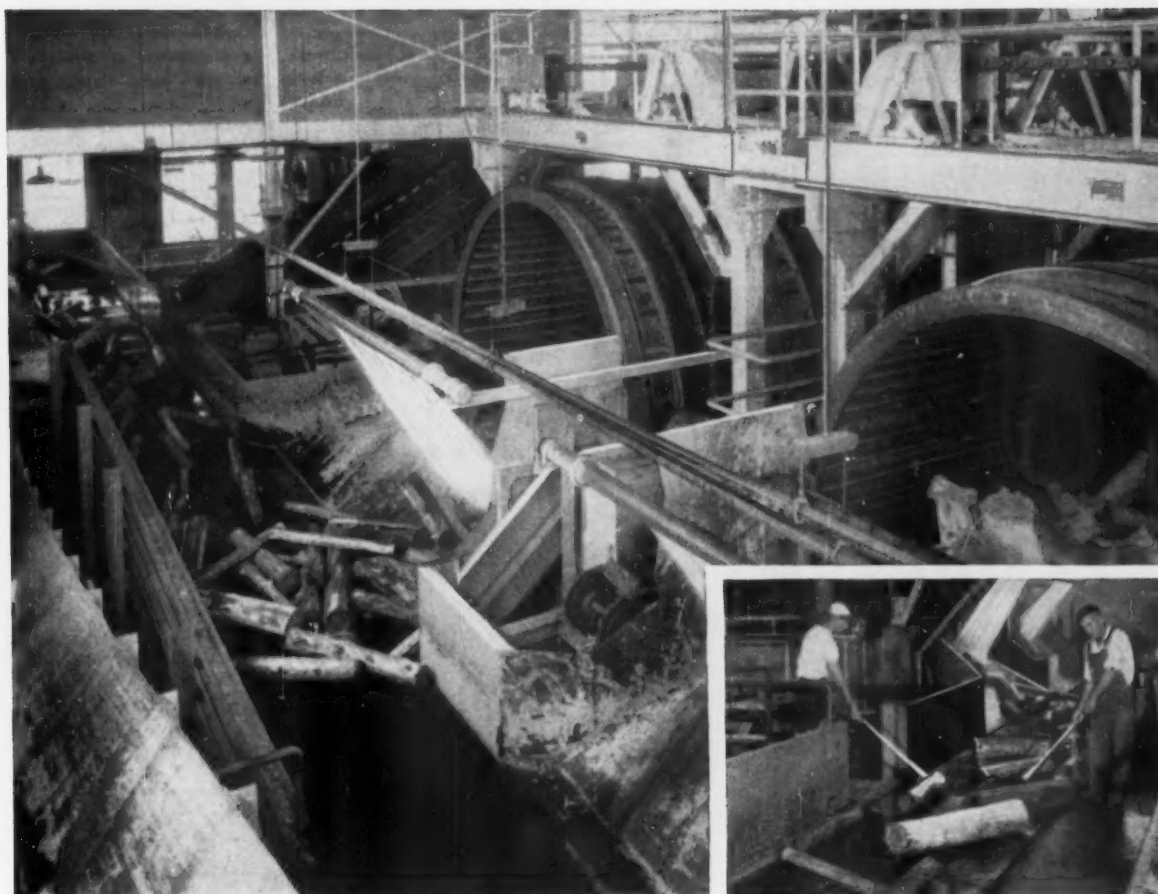
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Conveyor Belts

Logging a new record!



This U. S. Giant® 60" wide Log Sorting Belt is built to withstand the heavy impact of logs tumbling onto it from the debarking drums (left) and to resist the sharp points of the pickaroons which the men use to sort out rejects (right).

When the Mosinee Paper Mill Company, Mosinee, Wisconsin, required a conveyor system to step up production of wood and pulp, they turned to the company that had helped with the same problem on many installations in the United States and Canada—U. S. Rubber.

"U.S." engineers studied the requirements, the mill layout, and—above all, the problem of costs. Eight "U.S." conveyor belts were installed, made endless on the job. Production went up to a new record for the log-sorting operation of Mosinee Mills.

The easiest and most economical way to increase haulage and to lower costs is to enlist the services of United States Rubber conveyor belt engineers. Their wide and varied experience in materials handling for the wood products industry allows them to give you the very best help obtainable.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and the finest quality industrial rubber products.



Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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In Canada: Dominion Rubber Company, Ltd.

pres., Solvay Process Div., Allied Chemical Corp., succeeding LESTER B. GORDON, retired. . . . PERRY H. BROWN, '55 grad of Lowell Tech Institute, is director of quality control at Albany, N.Y., plant of Albany Felt Co. . . . EUGENE C. MEDCALF is now mgr. of intermediates dept., American Cyanamid Co.

GAYLORD BEASON, exec. vice pres. and gen. mgr. of Sutherland Paper Co.'s Fort Orange, N.Y., subsidiary, died Dec. 12. He is succeeded by ROBERT P. JONES, who has been v.p. i/c sales and asst. secretary.

EDWARD M. FEELEY has been named vice pres. i/c sales and THOMAS A. BOYLE vice pres. i/c mfg., Trinity Equipment Corp. (Industrol).

LEON E. SMITH has retired from active traveling for Rice Barton Corp., will be retained for special sales engineering and consulting. He will headquarter at Chester Valley Engineers, Paoli, Pa. GARFIELD E. SMITH, Leon's son, heads the group.

ARTHUR PHILLIPS JR. has been named vice president, Solvay Process Division, Allied Chemical Corp.; VERNE W. AUBEL JR., director of sales; ROBERT L. REYNOLDS, asst. director of sales and G. RICHARD BARCLAY, manager of sales dept.'s organic chemicals section. . . .

W. ADRIAN KING is v.p., chemicals division, Olin Mathieson Chemical Corp. . . . J. DUKEHART CHESNEY, purchasing agent, Huyck Felt Co., has been elected



Fred E. Bahrenburg Promoted at Hammermill Paper Co.

. . . to the position of vice pres. and mgr. of mills. A director, he was formerly plant mgr. of the Erie (Pa.) div. and will continue as gen. mgr. of Watervliet Paper Co., Watervliet, Mich. subsidiary of Hammermill. Promoted to the newly created position of mgr. of mill operations was ROBERT S. YOUNG, who was previously gen. supt. of the Erie mill. Mr. Bahrenburg joined Hammermill in 1948 following association with Strathmore Paper Co. as asst. to the pres. Mr. Young is a 41-year veteran with the firm.

v.p. of the National Assn. of Purchasing Agents. . . . THOMAS R. ELMBLAD, formerly in Whiting Corp.'s Chicago office moves to Pittsburgh, Pa. . . . FRANK W. DENNIS, DR. EARL L. WHITFORD and ROBERT E. WILKIN have been elected senior v.p.'s. Hooker Chemical Corp. JOHN S. COEY was elected v.p., eastern chemical sales. . . .

. . . ARNE HALLENCREUTZ, president of American SF Products, Inc., has moved into larger quarters at 420 Lexington Ave., Room 507, New York City. . . . Maurice R. Castagne



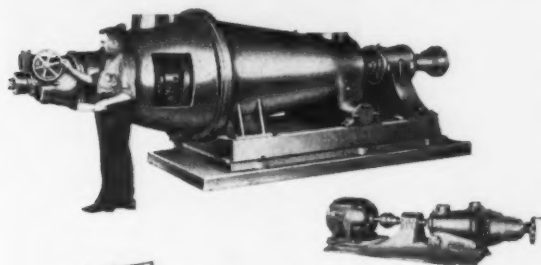
Harold M. Annis, Vice Pres., Oxford Paper Co.

. . . formerly technical director, Oxford Paper Co., Mr. Annis has been elected vice president, research and development, a new post. A graduate of Miami U., Oxford, O., he attended the Institute of Paper Chemistry, joined Oxford 22 years ago after serving as technical director of Allied Paper Mills and in technical service with Mead Corp. At Oxford he has been manager of sales service, mgr. of product development and asst. to the vice president i/c of mfg. He is a member of the executive committee of TAPPI, was recently nominated to be vice president. He and his wife live at Chappaqua, N.Y. with their son, Stephen.

CUSTOM FABRICATIONS

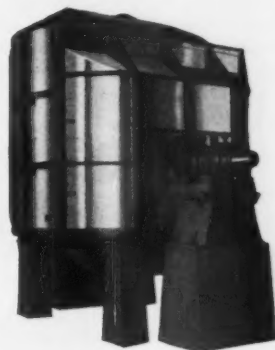


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Jones

JORDANS — A size for every need — plus wide choice of tackle and plug adjustment mechanisms. Split small heads avoid necessity of dismantling bearings. Ask for Bulletin EDJ-1007B

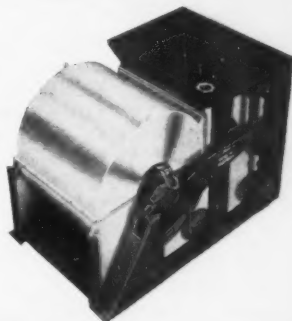


Jones

HI-LO PULPER — Two separately powered rotors provide maximum pulping and complete defibering of even the toughest wet strength materials. Details in Bulletin EDJ-1063B.

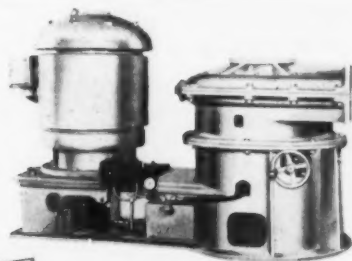
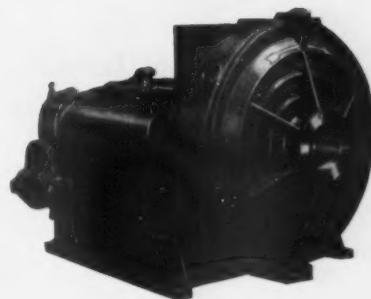
Jones

BEATERS — Complete "packaged" units of proven Jones-Bertrams design give better formation, more uniform treatment, substantial savings in time and operating cost. Bulletin EDJ-1079.



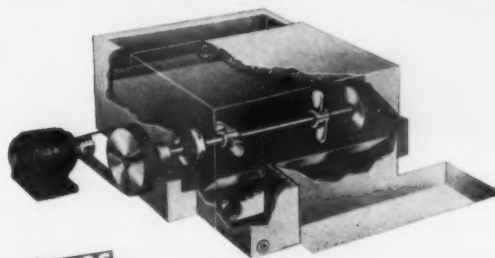
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DOUBLE - D REFINER — Exclusive double refining area permits two stages of refining in one pass — does twice the work and produces better quality stock. Ask for Bulletin EDJ-1083.



Jones

ROTO-PULPER — Compact, vertical, single disc refiner designed to handle high-consistency stock. Variety of interchangeable plates for mixing bleach, defibrating, decorticating, shredding, etc.



Jones

LIEBECK DISINTEGRATORS — Low cost slushing for soft pulp, and broke not containing wet strength substances. Units and tanks custom-designed to fit your needs and space. Bulletin EDJ-1061.

E. D. Jones Corporation
Pittsfield, Massachusetts

Export Agents: **CASTLE & OVERTON, INC.**, New York 20, New York

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Jones

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Pacific

WILLIAM C. BIRDSEY, for the past 10 years mgr. of manufacturing for the Pioneer div. of Flintkote Co., joins Fibreboard Paper Products Corp.'s manufacturing div. as project director, paper-board. . . WILLARD T. "BILL" SAMPSON, personnel dept., Crown Zellerbach Corp., Camas, Wash., has been elected president of the Camas Kiwanis Club. . . ALAN

H. AMES, president of Ames Harris Neville Co., subsidiary of Boise Cascade Corp., builders of a new paper mill in Wallula, Wash., is a new director of Boise Cascade.

JOHN K. DAVIS, paper mill supt. for Crown Zellerbach Corp., Port Townsend, Wash., retires after 37 years' service, and PHILIP B. MORIO, paper mill shift foreman at Port Angeles, retires after 33



Salmonsons Celebrate 50th

S. A. SALMONSON, who retired a few years ago as supt. of Soundview Pulp and is now a pulp mill consultant, residing at Yachats, Ore., and Mrs. SALMONSON celebrated their 50th wedding anniversary by repeating marriage vows in Portland at the home of son, WALTER, Pacific Coast mill equipment mfrs. representative. Sam Salmonson formerly was supt. and operating executive in mills in Quebec and British Columbia.

years. . . GEORGE H. GALLAWAY, asst. vice pres., manufacturing at Crown Zellerbach headquarters, is celebrating completion of his 25th year with the firm.

Two St. Regians are still talking about a chance meeting near the summit of Blewett Pass high in the Cascade mountains of Washington. A. C. "ACE" MCCORRY, manufacturing representative for St. Regis Paper Co.'s kraft pulp div., returning from a hunting trip in eastern Washington stopped to aid a man crawling from a wrecked automobile. Moments later WELDON HUNTER, Tacoma pulp tour foreman eastbound on a hunting trip, approached and stopped. Pausing briefly, they aided the stricken motorist, helped set out warning lights for all motorists and went their opposite ways.

JOHN M. FULTON, corporate representative for Crown Zellerbach Corp., is new pres. of the Portland (Ore.) Chamber of



Boylon Lambert Morasch

Crown Z Honors Old-Timers

. . . at the Camas, Wash. div. Among the 47 employees who received pins denoting 25 to 40-years service was CONRAD MORASCH, wood mill supt. Here he receives his 25-year emblem and welcome into the senior-service group from F. O. BOYLON, res. mgr. Master of ceremonies at the dinner meeting was J. E. LAMBERT, gen. supt., wood mill-finishing and services.

Play It Smart!

Use Bitusize® "B" emulsified asphalt integral sizing to get high dry and wet strength in all your hard sized grades of board. Contact our office nearest you for complete information.

American Bitumuls & Asphalt Company

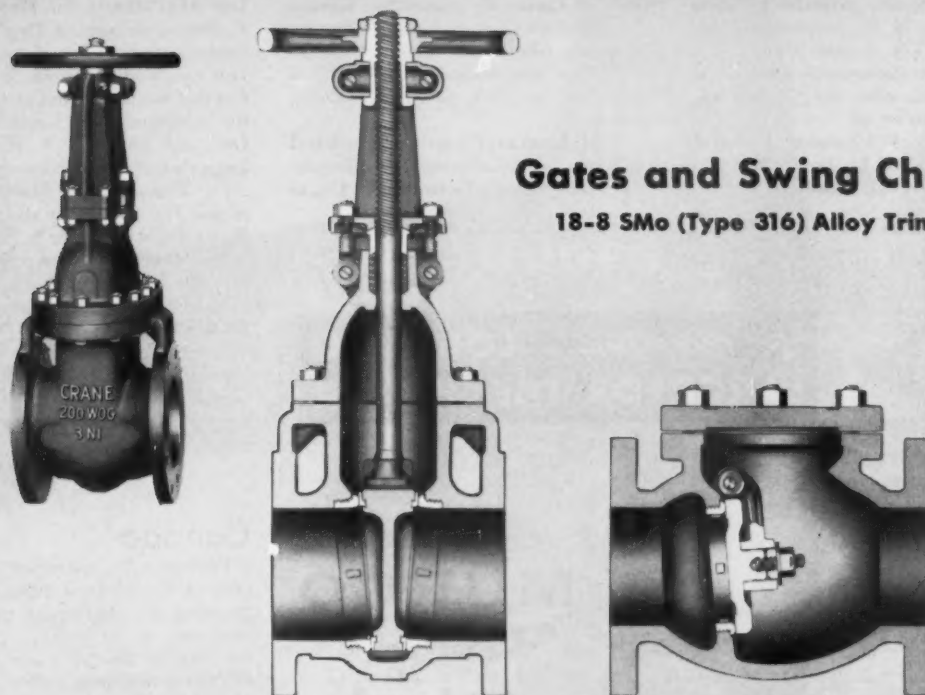
320 Market St., San Francisco 20, Calif.

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Cincinnati 38, Ohio St. Louis 17, Mo. Oakland 1, Calif.
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Bitumuls® Emulsified Asphalts • Chevron® Paving Asphalts
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NEW CRANE VALVES FOR PROCESS INDUSTRIES

3% NICKEL ALLOY CAST IRON



Gates and Swing Checks

18-8 SMO (Type 316) Alloy Trimmed

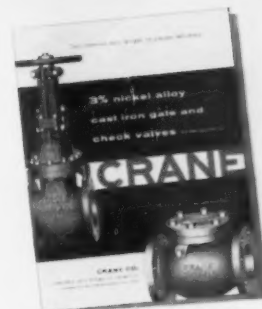
11 SIZES — 2 TO 18 INCHES

Better Corrosion Resistance . . . Longer Life . . . on More Fluids

This metal—Crane 3% nickel alloy iron—was developed especially to extend the usefulness and economy of cast iron valves in the process industries.

At but slightly higher cost, Crane 3% nickel iron valves provide substantially better resistance to corrosion than ordinary cast iron, and they have notably higher physical properties. Efficiency is stepped up further with Crane 18-8 SMO (Type 316) stainless steel trim.

Typical Recommended Applications: You will save with these valves—in the petroleum industry, for example—on oils containing traces of mineral acids; in wood-treating processes—on creosote vapors and oils; in pulp and paper mills—on alkaline liquors of various kinds. In general, they should be considered where all-iron or brass-trimmed iron valves are subject to seat corrosion.



ASK FOR THIS CIRCULAR

Complete technical and specification data on these valves are given in Circular AD-2313. Ask your Crane Representative for a copy, or write to address below.

CRANE® VALVES & FITTINGS

PIPE • PLUMBING • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill.—Branches and Wholesalers Serving All Areas

Commerce. . . WILLIAM KING, veteran Pacific Coast sales representative for Dorr-Oliver Inc. who recently retired, is back in harness for a short period. He is at D-O's international headquarters in Stamford, Conn., to help WARD PITKIN, technical director of the Pulp & Paper div., establish new centralized division facilities. . . H. W. NEWSOME is mgr. of the new Los Angeles district sales office of Roots-Cornerville Blower, div. of Dresser Industries Inc., 5120 Pacific Blvd., Los Angeles 58.

Two men of International Paper's Long-Bell Div., J. D. LELAND, IP vice pres., and EARL H. HOUSTON, div. sls.

mgr., elected to board of directors of NLMA. . . DONALD HUNTER, production mgr. of Diamond Gardner Corp. Plattsburg and Ogdensburg, N.Y. mills, moves west as manufacturing mgr. of DG's new molded products operations at Red Bluff, Calif. . . LOWELL M. CLUCAS, mgr. of Crown Z's information services for past three years, promoted to director of public relations to succeed CHARLES E. ALLEN who resigned to join Hill & Knowlton, Inc., N.Y. pub. rel.-counseling firm.

T. M. LINDLEY, formerly pulp & board mill mgr. at Fibreboard's San Joaquin div., joins Georgia-Pacific Paper Co. at

Toledo, Ore. as production staff assistant.

STAN FREDERICK, chief accountant for St. Regis Paper, Tacoma, became well fixed transportationwise early in the holiday season by winning two 1959 Fords at an Aquinas Academy benefit raffle.

After attending meeting of Pac. Coast Div. AP&PMSA in San Francisco RALPH E. BRIGGS, sls. mgr. of Draper Bros. Co., Canton, Mass., remained long enough to visit Pac. Northwest mills in spite of the fact that weather all but precluded use of the company plane based in Portland, Ore., and piloted by F. H. IHLENBURG, Draper's technical service representative. . . THEODORE M. MARSHALL JR. is named Pac. Northwest sls. rep. for The Brown Co. with offices in Portland.

JOE MURPHY, supt. of converting plant since 1933, retired from Simpson Paper at Everett on Jan. 1. . . American Potash & Chemical Corp. names DR. DAVID R. STERN research mgr. at its Los Angeles plant. . . RICHARD C. ZELLERBACH, asst. to board chairman, CZ San Francisco, resigns to devote more time to outside interests. . .

—Louis H. Blackerby

Canada

FREDERICK W. BRADSHAW is exec. vice pres. of Consolidated Paper Corp. Ltd., Montreal. He was formerly vice pres. and exec. asst. to the pres. . . New pulping supt. at Dryden Paper Co. Ltd. is W. BUSH; new pulp mill supt. is W. E. HAVILAND, succeeding ARTHUR F. TEW, recently retired after 38 years.

C. C. RIPBERGER is gen. mill supt. at Thurso Pulp & Paper Co., Thurso, Que. Mill supt. is F. J. VANIER, with DOUGLAS LYONS asst. mill supt. RAY NEALE is technical director. LARRY BURNS, former mill mgr., has returned to the United States.

WILLIAM McMAHAN, vice pres. of Canadian Forest Products Ltd., Vancouver, B. C., is touring West Germany and the United Kingdom. . . JAMES POND is asst. personnel supervisor for Anglo-Newfoundland Development Co. Ltd. with headquarters in Grand Falls, Nfld. He joined the firm in 1928 and has been active in labor and sports activities.

Seven long-service employees of Fraser Companies Ltd. were honored recently at Edmundston, N. B., when AUBREY CRABTREE, chairman and president, presented them engraved gold watches to commemorate 25 years' service. They are K. W. MATHESON, asst. to the gen. mgr.; W. K. SCOTT, asst. supervisor of ind. relations; J. W. WETMORE, asst. supt., real estate operations; J. H. LOUDEN, supt., logging equipment and repair shop; F. B. RICHARDS, asst. controller; R. V. McCABE, accountant, and D. E. LARLEE, pulpwood supt., Restigouche, div.

HENRY J. MACKIN, 73, pioneer British Columbia forest industry executive, died December 22 at his Vancouver, B. C.



MURCO

HYDRAULIC

Wood Splitter



MURCO

HYDRAULIC

Wood Splitter

MURCO Hydraulic Wood Splitter has been designed for pulp mills processing logs that are too large in diameter to be handled by the chipper . . . extremely heavy construction to properly support the entire assembly, the base is an all-welded design made from structural steel . . . equipped with a stationary axe that quarters the wood in one stroke to reduce handling and operation to a minimum. Overall dimensions of splitter for 36" diameter wood 5' 3" long are 21' long x 5' 2" wide, x 5' 8 1/2" high.



CAPACITY
APPROXIMATELY
1 LOG PER
MINUTE.

WRITE

for proposal and quotations to meet your pulpmill requirements . . . specify maximum diameter and length of wood to be split.



D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1933 WAUSAU - WISCONSIN



As it has from its inception, the Huber, Ga., laboratory maintains a close relationship with customers through our Technical Service department. As our Georgia operations—and service to our customers—have grown, our laboratory has been enlarged to provide ever better service.

The largest of the Huber Paper Laboratory expansions was recently completed. The laboratory is equipped and manned to conduct the same kind of work that our customers perform in their own laboratories. We duplicate all of the essential stages of paper making from sheet to finished filled or coated paper.

If you would like to learn how the Huber Paper Laboratories can improve *your* product, we will be glad to sit down and discuss it with you.

J. M. HUBER CORPORATION

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**protects concrete floors
against corrosion and traffic**

**especially designed for pulp and paper plant requirements . . .
with excellent acid, caustic, solvent resistance . . . fast curing.**

1 SEVERE CORROSION • HEAVY TRAFFIC

For severe chemical conditions: splash, spillage, heavy chemical attack. Also for heavy foot and truck traffic. Non-skid properties. Long-wearing.

SYSTEM: Prime coat—Phenoline 300 Orange
Top coat—Phenoline 300
Total Thickness (trowel): $\frac{1}{8}$ inch

2 SEVERE CORROSION • LIGHT TRAFFIC

For severe chemical conditions, but little trucking or other heavy traffic: e.g., beneath tanks and equipment.

SYSTEM: Prime coat—Phenoline 300 Orange
Intermediate coat—Phenoline 302
Top coat—Phenoline 300
Total Thickness (brush or spray): $\frac{1}{2}$ inch

3 LIGHT CORROSION • LIGHT TRAFFIC

The economy coating for less severe conditions of corrosion and traffic. Non-skid properties. Easy to apply. Hard, tough protection.

SYSTEM: Prime coat—Phenoline 305 Primer
Top coat—Phenoline 305
Total Thickness (brush or spray): 25 mils

FREE . . . Sample panels of each system, on request. Write for complete details and recommendations for your service.

ANNOUNCING NEW PHENOLINE CONCRETE PRIMER for damp concrete which cannot be completely dried prior to application. Provides a tight bond for Phenoline top coats in all three systems.

SALES OFFICES:

Atlanta, Buffalo, Denver, Detroit, Houston, Los Angeles, Mobile, New York, Pittsburgh, San Francisco, Tampa, Tulsa, Toronto, other leading cities.



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**Specialists
in Corrosion Resisting
Synthetic Materials**



**R. G. McHugh is President
Of Powell River Sales Co., Ltd.**

He was formerly sales mgr. Becoming board chmn. of the sales company, Vancouver, B.C., is M. J. FOLEY, pres. of Powell River Co. Ltd. ROY W. FOOTE continues as vice pres.

"Dick" McHugh has been selling newsprint since 1937, when he joined G. F. Steele & Co. in New York, N. Y. Between 1939 and 1944 he represented Steele in Texas. In 1944 Powell River purchased the Steele company to form Powell River Sales, and in 1951 Mr. McHugh became mgr. of the latter firm. In another Powell River Sales appointment, HARRY CHAMBERS becomes comptroller and asst. secy. to succeed ALEX STEWART, who is retiring.

home. Mr. Mackin was a native of Oregon and came to western Canada more than 50 years ago as sales mgr. for the old Canadian Western Lumber Co. He became president in 1939 and was later one of the principal figures in launching Elk Falls Co. Ltd., now a division of Crown Zellerbach Canada Ltd. Mr. Mackin became a CZ director.

WILLIAM G. JAMES is asst. to the pres. of St. Lawrence Corp. Ltd., Montreal. According to president P. M. Fox, he is assisting in formulating and directing



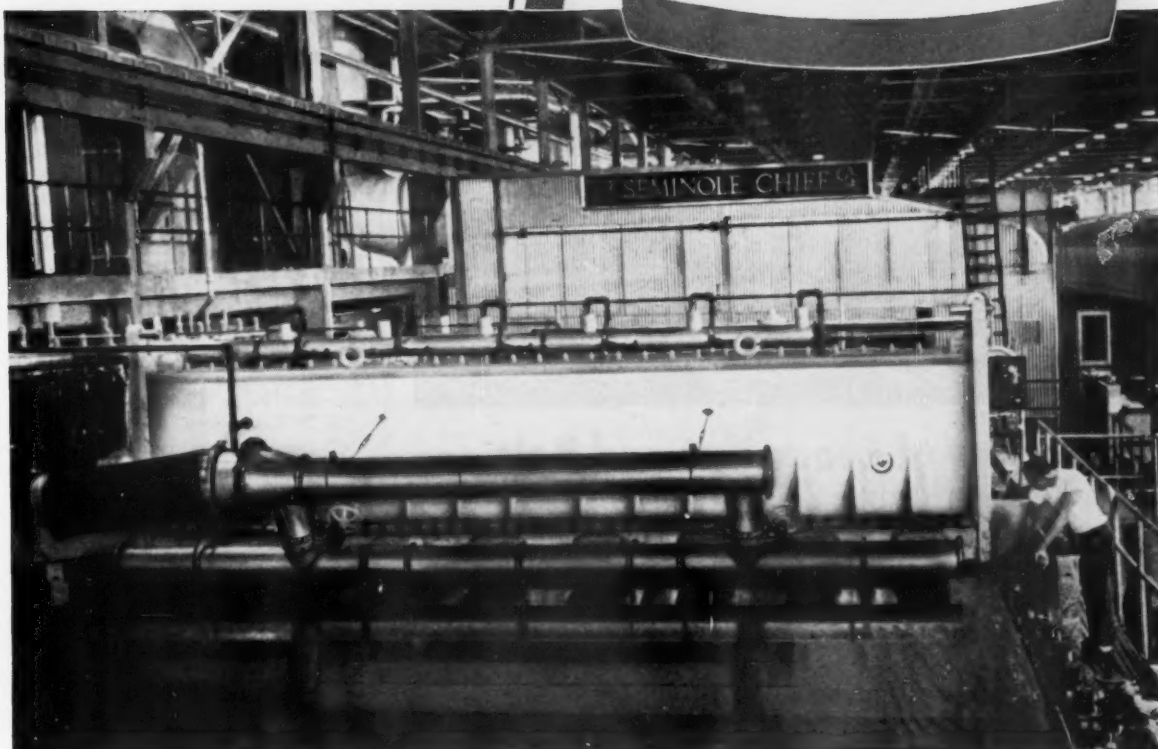
Oleskevich McKee

Promoted at Smooth Rock Falls

V. OLESKEVICH has been named mill mgr. at the Smooth Rock Falls, Ont., plant of Abitibi Power & Paper Co. Ltd. He succeeds W. A. PLANT, who retired following 39 years' service. Mr. Oleskevich came to Canada from his native Russia in 1913 and was graduated from McGill in 1932. He joined Smooth Rock Fibre div. in the early 30s, was made chief chemist in 1935 and asst. mgr. in 1948. New divisional gen. supt. is W. F. McKEE, Toronto born, he is a graduate of Ontario Agricultural College. He came to Smooth Rock Falls in 1944 as asst. chemist, rising to pulp supt. in 1953.

Another
pressure secondary
headbox by.....

VALLEY

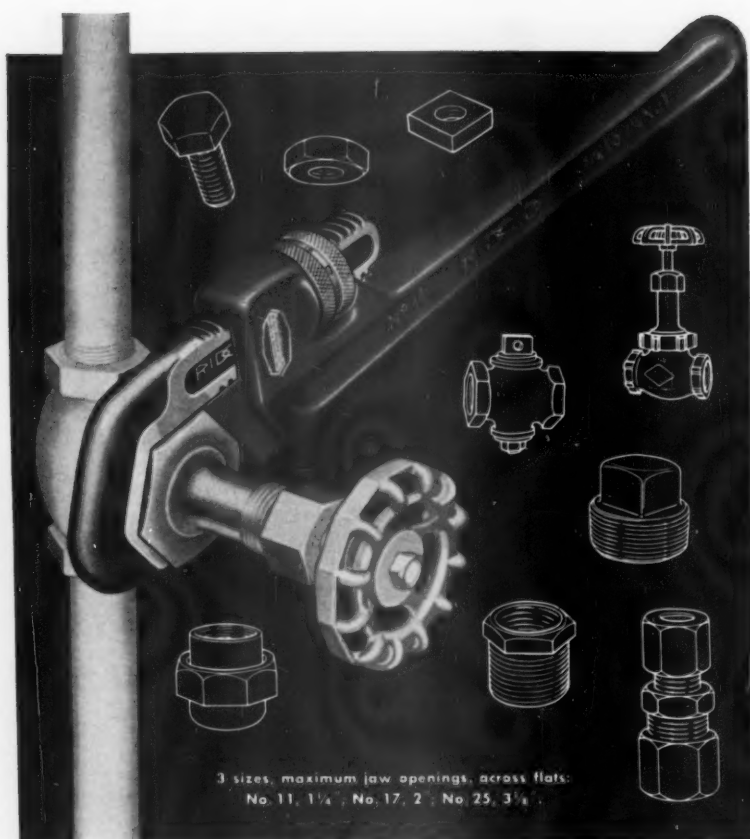


On

St. Regis Paper Company's
new giant paper machine
at Jacksonville, Florida.

VALLEY

IRON WORKS CO., APPLETON, WISCONSIN



Master of Every Nut and Bolt...

NEW RIDGID® Hex Wrench

**Wide-open fast-action multi-sided grip
on every hex, square and flathead!**



"Got the **RIDGID**
name on it?...
Okay, I'll take it!"

Quick adjustment—stays to size... this new Hex Wrench goes on easily, won't slip off—harder you pull, the tighter it grips... no more skinned knuckles or rounded nut shoulders! Narrow jaw for close quarters. Famous **RIDGID** heavy-duty design, guaranteed housing, comfort-grip handle. Three sizes for $\frac{3}{8}$ " to 2" nuts. Make your work easier and faster—buy new **RIDGID** Hex Wrenches at your Supply House!



The Ridge Tool Company

Elyria, Ohio, U.S.A.

THREADED PIPE... It's Tight... It's Best... Costs Less!

public relations and advertising policy. Mr. James formerly was with the Canadian Weekly Newspapers Assn.

C. RANN MATTHISON, gen. sales mgr. since 1951, is new administrative vice pres. of Westminster Paper Co. Ltd., New Westminster, B. C. N. W. MARKUS becomes vice pres., marketing, responsible for retail and industrial sales promotion, and GEORGE L. O'LEARY national retail sales mgr.—Charles L. Shaw.

Pulpwood Notes

HORACE G. COOPER, staff officer in charge of land uses on the Snoqualmie National Forest at Seattle since 1955, transfers to USFS Region 6 headquarters in Portland as equipment officer in the fire control div. replacing A. B. EVERTS, who transferred to the California Forest & Range Experiment Station. . . . GORDON S. YOUNG promoted from personnel supervisor to safety supervisor at Crown Zellerbach Corp.'s Neah Bay logging operation.

C. S. "PAT" HERR, vice pres. & woodlands mgr. of the Brown Co., Berlin, N. H., has been selected to deliver the Col. W. B. Greeley Lectures on Industrial Forestry at the College of Forestry, University of Washington, Seattle, Feb. 26, 27 and 28. On the 28th Mr. Herr's final lecture will be the main speech at the joint Forest Club Alumni banquet.

T. S. KAMPMANN, working on timber inventories and management plans at USFS regional div. of timber management in Portland, Ore., since 1956, left for Iran in January on International Cooperation Admin. assignment. . . . CHARLIE WILSON, retires as logging supt. of the J. Neils Lumber Co. div. of St. Regis at Glenwood, Wash. after 50 yrs. of logging. Well known in Pacific Northwest woods operations, he is credited with developing the skidding pan and as co-developer of the W-B quick-release log binder and log grapple, all produced by ESCO.

Champion Paper & Fibre Co. has established a new Timber Division, headed by ARTHUR W. NELSON, JR., general mgr., to manage its 600,000 acres of timberland, especially in the Carolinas, Georgia and East Texas, and the development of products from these holdings. A. C. SHAW has been named assistant for forestry under HENRY RIGBY, vice pres., operations, to analyze and evaluate new undertakings in this field. . . .

Promoted in Internation Paper's Long-Bell div.: STEPHEN WAITE, resident engineer of Vernonia operations, becomes asst. chief engineer at Longview succeeding CLYDE PUMPHREY who was appointed logging supt. of firm's Lewis River operations. . . . ROBERT L. JORDAN, formerly of Mont. state forestry dept., is appointed San Francisco dist. mgr. of AFPI replacing ALVIN KLOTZ who joined U. S. Plywood Corp. at Anderson. . . .

BELOIT UNIT MODERNIZATION



ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS

Basis weight and caliper erratic?
Flow "skating" on Fourdrinier wire?
Formation streaky or lumpy?
Insufficient head for machine speed?
Frequent headbox washups necessary?
Sheet tests marginal?

Beloit Air-Cushioned Inlets ...4 types to help solve your wet end problems

If you are troubled by any of these common problems, it will pay you to replace your obsolete inlet with a new Beloit Air-Cushioned Inlet. Beloit inlets are now available in *four* distinct types . . . suitable for every grade, speed, and price range . . . engineered to your exacting requirements. Beloit Air-Cushioned Inlets include these features: positive stock level control for optimum flow conditions • micrometer-type adjustment with flexible slice lip • simplified precision slice-adjusting mechanism • edge control • effective foam-killing showers • variable speed rectifier rolls • adjustable throat • rugged stainless steel construction • Beloit custom controls • self-cleaning design.

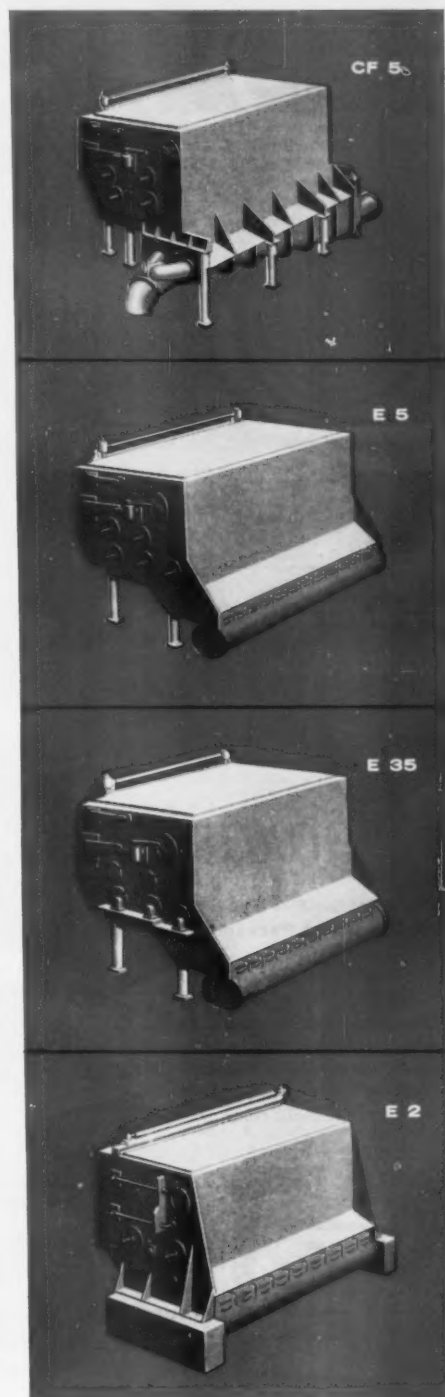
» **ACT!** For full information about the new Beloit Air-Cushioned Inlet for your machine, write to Beloit Iron Works, Beloit, Wisconsin.



BELOIT

PAPER MACHINERY

your partner in papermaking



Meet Huyck's FITZGERALD



Gerald N. Fitzgerald, more often called "Gerry" by papermakers, is Manager of Customer Service at Huyck's. He is responsible for handling all inquiries and orders and seeing to it that all requests and requirements are fully complied with. Probably one of the best known men at Huyck's, Gerry has chalked-up over 23 years in feltmaking, is well-trained in all phases of production and sales administration — and, as expected, provides the answers to customers' questions.

HUYCK FELTS

First in Quality . . . First in Service Since 1870

PULP & PAPER

Strictly Personal

Crown Z Building Chemical Products Plant

Crown Zellerbach Corp. is constructing a 3-story chemical products pilot building at Camas, Wash., scheduled for completion in March. It will be used primarily for housing pilot plants and enable chemical engineers to test and project crucial processing steps with small-scale operating models. "With this kind of mini-planting we can keep mistakes on a small scale and make corrections before going into the pilot plant phase," states Dr. W. W. Hearon, gen. mgr., CZ's Chemical Products Div.

Gordon Gerttula, supervisor of process eng., is to be in charge with an initial staff of six chemical engineers plus technicians, mechanics.

Crown's Chemical Products Division manufactures and sells a growing line of products made from the previously unused residues of wood-pulping. Its Orzan line includes products used in dust control and plant production, in asphalt emulsions, adhesives, gypsum board, insecticides, leather, and concrete additives.



GORDON GERTTULA will be in charge of CZ's Chemical Products plant, Camas.

Coatings—Past, Present Future—Meeting Theme

The 10th Annual Coating Conference of TAPPI will be held at the Statler Hilton, Boston, May 25 through May 27. Reservations should be made direct with hotels.

Program Chairman R. W. Hagemeyer, Wyandotte Chemicals Corp., announces these speakers for a panel symposium:

"Coatings—Past"—Norman Bearse, mill manager, Oxford Paper Co., Lawrence, Mass.; "Coatings—Present"—Harold Annis, technical director, Oxford Paper Co., New York, N. Y., and "Coatings—Future"—Paul Thoma, technical director, Time, Inc., Springfield, Conn.

William Aiken, director of research and development, Diamond Gardner Corp., Middletown, O., will discuss "Board Coating: Past, Present, and Future." There will be also four general sessions of technical papers.

Eaton-Cleveland Gear Merger

Directors of Eaton Manufacturing Co. and Cleveland Worm & Gear Co. at separate meetings here approved a transaction whereby Eaton will acquire the assets and business of Cleveland Worm & Gear and its wholly-owned subsidiary, the Farval Corp.

Atom Expert Joins B&W

DR. LAUCHLIN M. CURRIE, newly elected vice president of Babcock & Wilcox Co., in charge of its atomic energy division, joined the American atomic energy program in 1943 when he was selected associate director of war research for the Manhattan District atom bomb project. He was a technical observer during the Bikini atomic tests. He is distinguished abroad as well as in the United States for his activities in the nuclear energy field.

COSTS PENNIES A DAY...

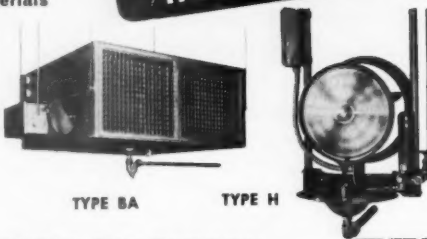
HUMIDITY CONTROL

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Guaranteed

For Trouble-Free Processing, Storage
of Paper and Packaging Materials

Units cost as little as \$10 per unit per year to operate. Self-contained water or steam units require no floor space, minimum maintenance; can be installed singly or in groups. Have high capacity, automatic controls.



TYPE BA

TYPE H

HELPFUL FREE BOOKLETS

Just clip coupon to letterhead and send for these booklets today.

1. Illustrates and details complete line of humidifiers
2. Contains factual answers to humidity problems in printing.

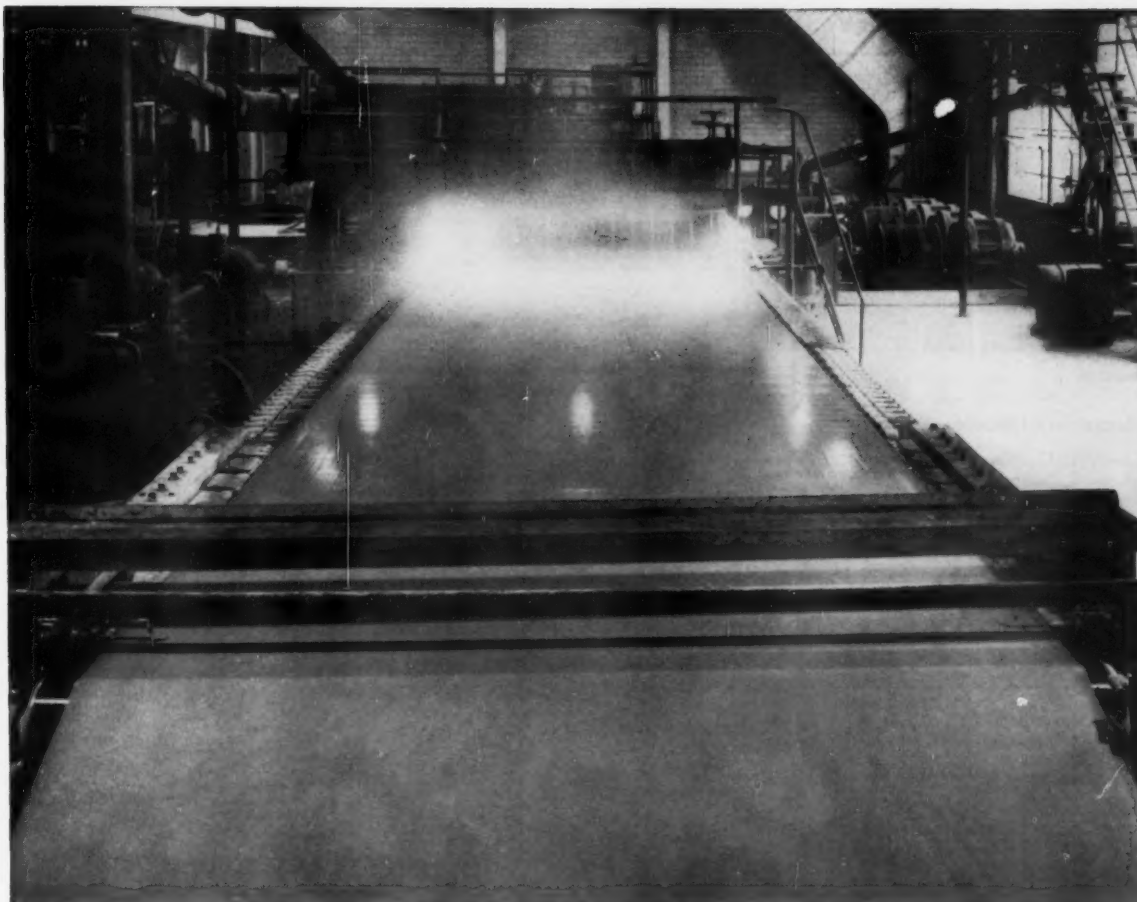
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THE BAHNSON COMPANY

PA-1

Winston-Salem, N.C.





A Complete Starch Line... *tailor-made to your needs*

Today's complex papermaking operations require a wide range of starches—starches specifically designed to do a particular job. You'll find that the complete starch line offered by Corn Products Company includes types for every phase of modern papermaking. These starches are available in so many varieties that *they can literally be tailor-made to suit individual requirements* and production problems of individual plants!

For example, in beater sizing, preferred starches for improved surface qualities plus excellent bursting and tensile strength, include the many varieties of Globe and pre-cooked Amijel. For calendar sizing, you'll find a complete line of Claro and Eagle starches, as well as Globe starches for enzyme conversion. In this operation, Globe and Exello dextrines and thin-boiling Foxhead starches are also used. For general coating, with good

viscosity at high solids content, use Claro and new improved Ten-O-Film starches.

And the research staff of Corn Products Company, largest in the industry, is constantly at work developing new products to meet the changing needs of modern papermaking.

Our technical representatives are completely versed in the problems that arise with wet end additives. Their impressive field experience and continuing research into starch, evidenced by frequent publications in trade and technical journals*, is always at your service. Take full advantage of the facilities and experience of the world's largest corn processors—call our nearest sales office or write direct.

Fine products for the Paper Industry: GLOBE® • EAGLE® • FOXHEAD® • CLARO® • AMIJEL®
CORAGUM® • TEN-O-FILM® starches • GLOBE® • EXCELLO® • LAM-O-DEX® dextrines and gums.



CORN PRODUCTS SALES COMPANY • 17 Battery Place, New York 4, N. Y.

*A reprint on the results of corn starch usage is available on request from our New York office

PICTURE NEWS OF THE INDUSTRY



Thurston Copping

International Names Managers

LAURENCE G. THURSTON, formerly asst. mill mgr., has been named mgr. of the Niagara Falls, N. Y. mill of International Paper Co. He succeeds H. PERRY BAILEY, who has retired following 38 years' service. ALLAN B. COPPING became mgr. of the Otis mill at Chisholm, Maine, to replace THOMAS G. MANGAN, retiring after 42 years with IP.

Mr. Thurston, graduate of the University of Maine, joined IP in 1926 at the Pierceville, N. Y. mill. Following a brief period at Niagara Falls, he moved to Ticonderoga as a beater foreman. He became Ticonderoga paper mill supt. in 1940 and asst. mill mgr. in 1947. He moved to Niagara Falls last year. Mr. Copping moves up from asst. mill mgr. at Chisholm. He is a graduate of McGill University and joined International in 1925 when that firm purchased DeGrasse Paper Co. Following assignments at Corner Brook, Nfld., Glen Falls, N. Y., and Chisholm, he was named asst. mgr. at the Palmer, N. Y. mill. In 1958 he was made asst. mgr. at the Otis plant.



Beckett Ozias

Oxford Miami Promotes Two

ROBERT E. BECKETT is paper manufacturing asst. to the mill mgr. at the Oxford Miami div. of Oxford Paper Co. in W. Carrollton, Ohio. He was formerly gen. supt. and in his new position will work closely with mill engineering in design and planning. He will also function in an advisory capacity on manufacturing. JAMES H. OZIAS succeeds him as gen. supt. Formerly asst. gen. supt., he will have operating and administrative responsibility and control over the production organization and facilities.

Mr. Beckett joined Oxford Miami in 1915, became machinetender and in 1932 was named night supt. He became gen. supt. in 1943. Mr. Ozias joined the firm in 1946 and was production control supervisor prior to becoming asst. gen. supt. in 1955.



Wm. J. Luchesi Heads Sales

... for Blandin Paper Co., Grand Rapids, Minn. producer of publication grades. He is manager of the firm's newly formed sales organization with offices at 200 East 42nd St., New York 17. Mr. Luchesi will be assisted by ALFRED R. "RANDY" HEATH and WILLIAM R. ROBERTS. All three were formerly associated with Bulkley, Dunton Paper Co. S.A. Also in sales is E. HENRY RECTOR, who was previously with St. Regis Paper Co. Blandin manufactures paper primarily for the magazine field, coated and uncoated.



P. M. Shaffrath Named Mill Mgr.

... of the Millinocket, Maine mill of Great Northern Paper Co. A graduate of the New York State College of Forestry, he was formerly director of research for Oxford Paper Co., Rumford. He formerly was in charge of the Syracuse research program that resulted in development of the chemigroundwood pulping process. Following graduation he was with New York & Pennsylvania Co. and later was on the staff of Howard Paper Mills Inc.



John Quackenbush, P-G. Manager in Chicago

John Quackenbush is new manager of the Chicago office, pulp sales, Perkins-Goodwin Co. He joined Perkins-Goodwin in 1948 as representative in the middle west.



Tany Agronin Becomes President Of Appleton Machine Co.

He was formerly executive vice pres. and gen. mgr. He joined the Appleton, Wis., firm in 1957 after serving as mgr. of Black-Clawson Co.'s Brazilian affiliate, Companhia Federal de Fundicao. In other Appleton Machine promotions, VICTOR W. BLOOMER, formerly pres., becomes chmn. of the board, and JOHN MACDONALD JR., mgr. of market development, becomes vice pres.



Homes Ege Peterson

Valley Iron Works Honored

... by the Dept. of Defense for its "outstanding cooperation with the reserve program of the armed services." At a dinner in Appleton, Wis., the Reserve Award Citation was presented to R. A. PETERSON, pres. of Valley Iron, by COL. CHARLES EGE, chief of the Wis. Sector of the 14th Army Corps (reserve). Participating in the program was W. A. HOMES, asst. gen. mgr. of Valley.



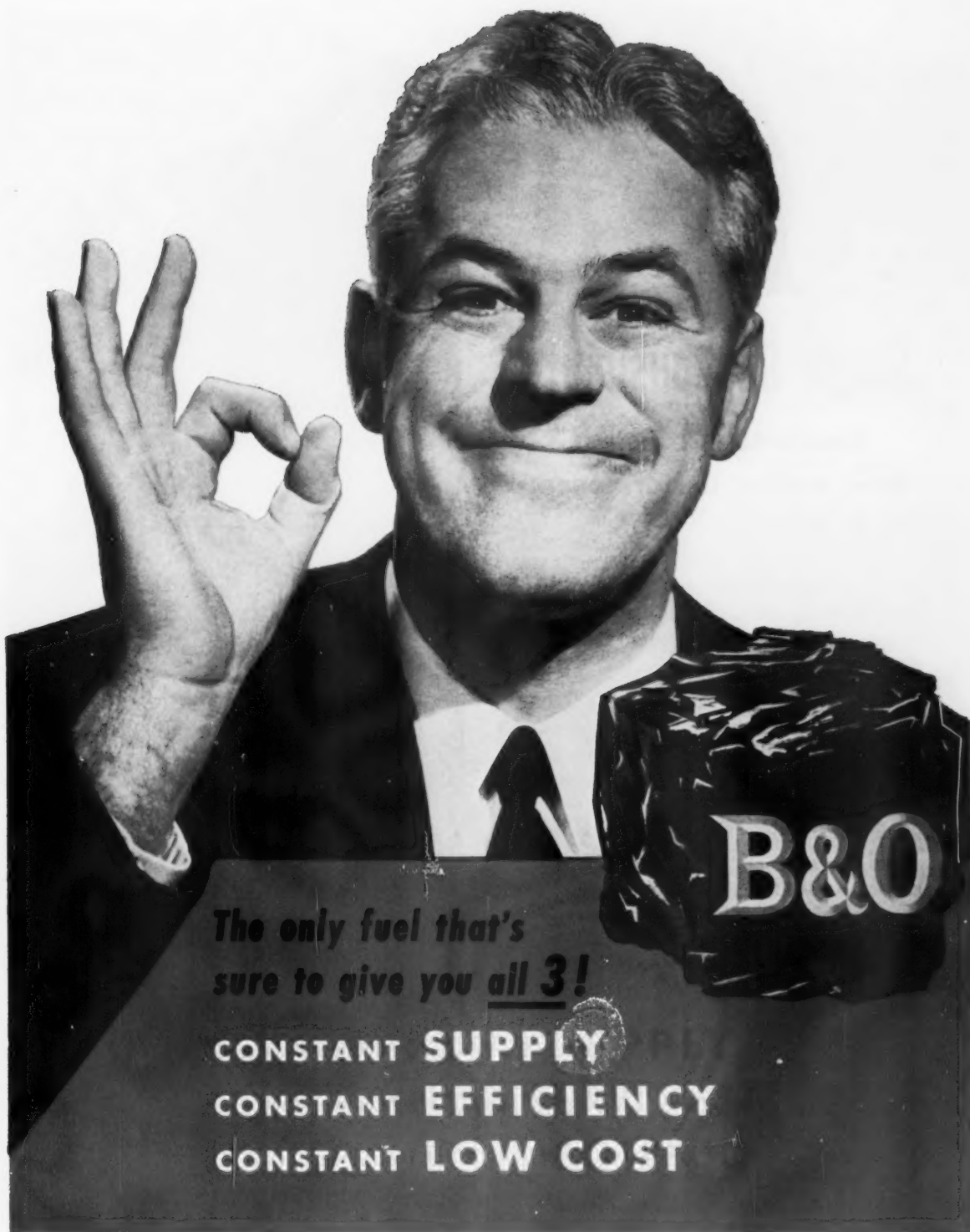
Dirksen Kolb

AP&CC Sales Appointments

American Potash & Chemical Corp. announces two major appointments in its eastern sales dept., New York, N. Y.

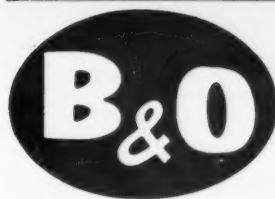
A. J. DIRKSEN, former gen. sales mgr. of the industrial chemicals div., will be mgr. in charge of all eastern area sales. He joined the firm in 1953 as director of market development.

E. M. KOLB has been named asst. to the vice pres. in charge of sales and will continue to head the company's potash activities. He was formerly gen. sales mgr. of the heavy chemicals div.



*The only fuel that's
sure to give you all 3!*

CONSTANT SUPPLY
CONSTANT EFFICIENCY
CONSTANT LOW COST



BITUMINOUS COALS FOR EVERY PURPOSE

Ask our Man! BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD. Phone LExington 9-0400



Single Responsibility

**Guarantees efficient,
time saving performance**

CB&I offers operators the advantage of a single *industry-experienced* source for construction of steel process equipment and storage vessels—from design, through fabrication and erection.

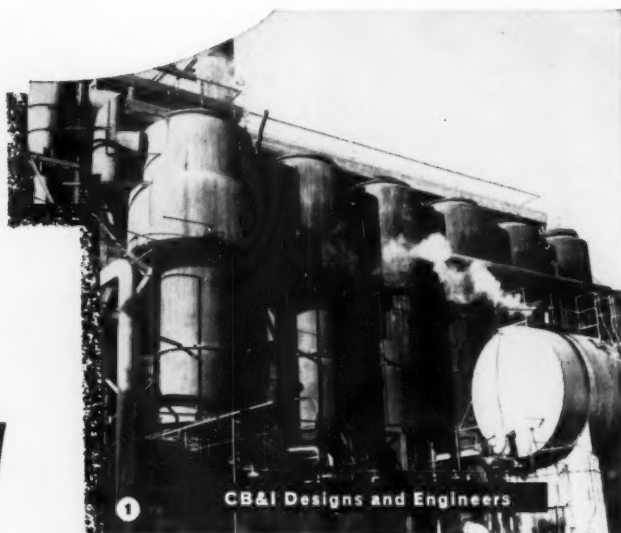
These highly coordinated services include the most extensive metallurgical inspection and control facilities available anywhere . . . equipment and techniques for stress relieving and X-ray in the shop or field — as well as the most modern automatic welding practices.

On your next job, the single responsibility services of CB&I will assure you of structures that *work* for you rather than merely *serve*. It's the reason why many companies are repeat customers for CB&I-built vessels.



Chicago Bridge & Iron Company

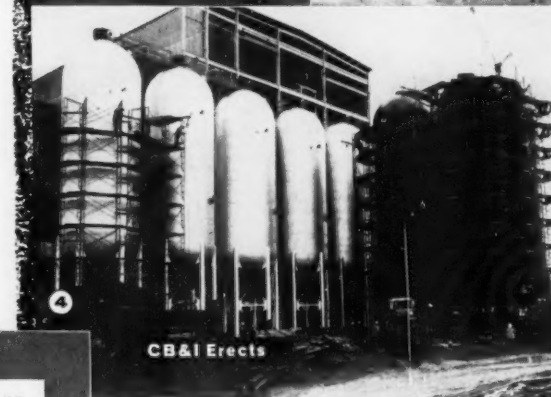
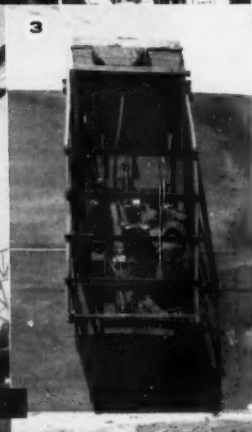
Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston • Kansas City (Mo.)
New Orleans • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • South Pasadena • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY,
GREENVILLE, PA. and at NEW CASTLE, DELAWARE.
In Canada: HORTON STEEL WORKS LTD., TORONTO, ONTARIO



CB&I Designs and Engineers



CB&I Fabricates



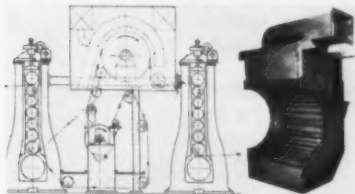
CB&I Erects

- 1 Stainless steel Hortonclad® sextuple effect evaporator for foaming black sulfate liquor.
- 2 13-ft. diameter by 63-ft. digester leaves CB&I stress relieving furnace.
- 3 CB&I-patented girth welder insures strong, uniform welds.
- 4 Seven 17-ft. diameter sulfite digesters and four 17-ft. accumulators were erected, welded, stress relieved and X-rayed by CB&I at this site.

PP20

High-Velocity Dryer

... For High-Speed Operation



Applications: For use with Black-Clawson cutters.

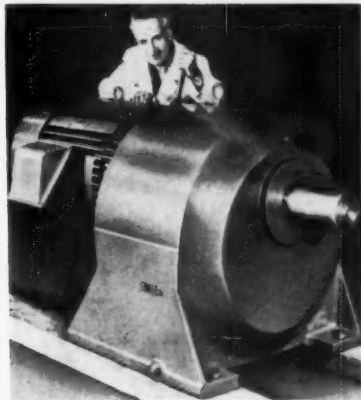
Advantages: The 3-D dryer features "an extremely efficient method of introducing and removing hot air evenly across the web." The unit is designed for high-velocity, high-temperature and high-volume operation and is being evaluated in the laboratory of a prominent paper manufacturer. Several production units are being manufactured.

Specifications: The 3-D dryer is furnished for paper machine application for either steam or gas heating.

Supplier: Black-Clawson Co., Dilts Div., Fulton, N. Y., U. S. A., and Black-Clawson International Ltd., 18 Savile Row, London W. 1, England.

Gearmotors

... Largest Standard Units



Applications: For driving production machinery.

Advantages: These GearMotoR drives (sizes J and H) are said to be the largest standard drive units ever produced. According to the manufacturer, maximum durability and strength are designed and built into the drives. Final stage helical gearing is carburized and hardened, and gear teeth are precision ground. Large-diameter shafting and over-size bearings are said to have sufficient reserve capacity to handle the most severe

overhung loads and shock conditions. **Specifications:** The drives are rated up to 200 hp and feature high efficiencies of 94 to 97%. Double, triple and quadruple reductions are available in AGMA ratios ranging up to 440:1.

Supplier: Philadelphia Gear Corp., 3620 G St., Philadelphia 34, Pa., GARfield 6-9400.

Capsular Pressure Elements

... In 7/8 in. O.D. Size

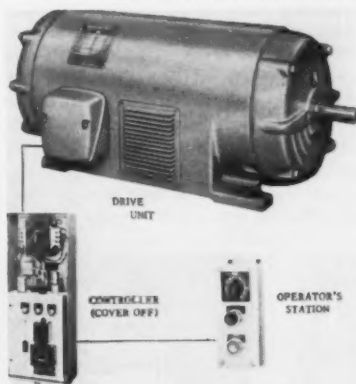
Applications: For use where miniaturization is an important factor.

Advantages: Excellent linearity and very low hysteresis are characteristic. **Specifications:** Available for either internally or externally applied pressures in ranges from 15-350 psi.

Supplier: The Bristol Co., Waterbury 20, Conn. PLaza 6-4451. Ask for Bulletin AV2001.

Adjustable Speed Drive

... Automatic Correction



Applications: To supply precise operating speeds for machine tools, process machinery, test equipment, wind-ups, conveyors, printing presses, etc.

Advantages: Maintenance of the Adjusto-Speed drive has been substantially reduced through the elimination of all brushes, commutators and slip rings. The length of the drive has been reduced up to 22%. Both the a.c. motor and eddy current clutch are built into a common housing. The drive shaft, height and diameter dimensions are the same as those of a standard motor of comparable rating. Motor end brackets are now interchangeable with standard flanges, and units can be flange-mounted to the driven machine. Finger-tip command of drive opera-

tions is concentrated in a separate operator's station. A tachometer feedback circuit continually monitors the drive shaft and automatically corrects speed as required. Jogging control is standard.

Specifications: The drive is available in ratings from 3/4- to 7 1/2-hp with a stationary field construction. It operates continuously at full load (constant torque) in ranges as high as 34:1, and for intermittent use from 0 to full speed or any rpm between.

Supplier: Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis., HUMBOLDT 1-600.

Carton Scorebend Tester

... One-Man Testing



Applications: To measure the force required to "break open" flat folded paperboard cartons.

Advantages: The instrument is "designed to help carton manufacturers control production quality and eliminate rejects, and to enable users of automatic equipment to specify cartons to a recognized standard and discover 'tough' cartons before they cause slow-downs and stoppages." The tester provides "simple one-man production testing with laboratory instrument precision." It employs a direct-reading force gauge mounted to accommodate folding cartons up to 22 in. wide when flat.

Specifications: Three models are available: for forces ranging from 0 to 500 gm; for forces ranging from 0 to 1000 gm, and for forces ranging from 0 to 16 oz. Model differences consist only in the force gage used, and all three gauges are interchangeable on the standard test stand and mount. The dial indicator hands can be made free-moving or set to hold the maximum reading. The tester weighs about



Lubriplate No. 630-2 is a high temperature, extreme pressure, water-repellent, grease type lubricant. Ideal for the general lubrication of Industrial, Automotive, Construction, Farm and Marine Equipment. Lubriplate Grease Gun Cartridges provide an easy, quick, economical means of application. Prevent the waste and mess of hand filling. Packed 10 Cartridges in a handy carrying carton.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

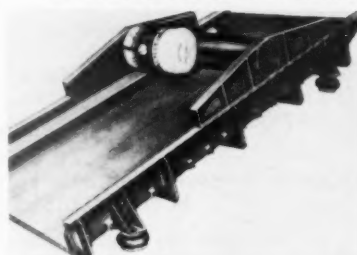
For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.



11 lb. and has an over-all height of 26 in. The price of the tester, including one of the three gauges is \$195.00. **Supplier:** Hunter Spring Co., Apparatus Div., 1 Spring Ave., Lansdale, Pa. (or Testing Machines, Inc., 72 Jericho Turnpike, Mineola, N. Y.)

Electromechanical Screen

... Utilizes No Belts or Chains



Applications: For dry or wet screening of bulk materials in a wide range of types and sizes.

Advantages: This new "unbalanced-motor" electromechanical vibrating screen is said to handle most materials ranging in size from 100-mesh to 3-in. lumps. The two available models utilize newly developed pneumatic vibration-absorbing mounting members that prevent transmission of vibration to the building structure or to adjoining equipment. The unbalanced electric motors are totally-enclosed self-contained units that eliminate the need for belts, chains and separate motor mountings. Screening surfaces are said to be easily replaceable in a variety of types and mesh sizes.

Specifications: The Syntron-Sinex screen is available in two models: the SS-146 with a 4- x 6-ft. screen surface

and the SS-1510 with a screening area of 5 x 10 ft. Both can be furnished as single- or double-deck screens with either 900- or 1800-rpm drives and can be arranged for either base or suspension mounting. Motors contain a thermal overload starting switch and operate from 220- or 440-volt, three-phase, 60-cycle alternating current. **Supplier:** Syntron Co., 659 Lexington Ave., Homer City, Pa., Tel.: 9-8011.

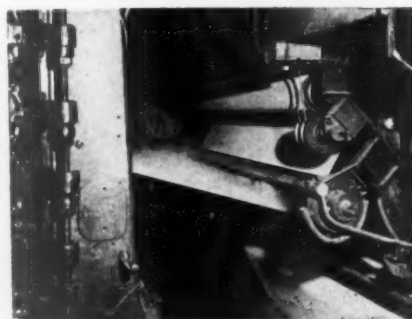
New Industrial Tractor-Loader

... Is Rugged and Powerful



Applications: For all industrial operations from heavy loader work to rugged back-hoe duties.

Advantages: Malleable iron combination grille and bumper enclose and protect headlights, cooling system, hydraulic reservoir and pump. All power steering system has exclusive feather touch instant response and steering wheel requires less than a complete turn to go from straight ahead to full right or left. Foot throttle



Improve Paper Quality

with

DUPASQUIER DRIPLESS STEAM SHOWER PIPE

- **WET END**—breaks up bubbles, disperses foam
- **DRY END**—increases sheet moisture, improves finish, lowers bulk and caliper
- **SAFELY USED** anywhere dripless steam desired

Custom Built for Any Machine
U.S. Pat. No. 2642314,
in Canada No. 509451

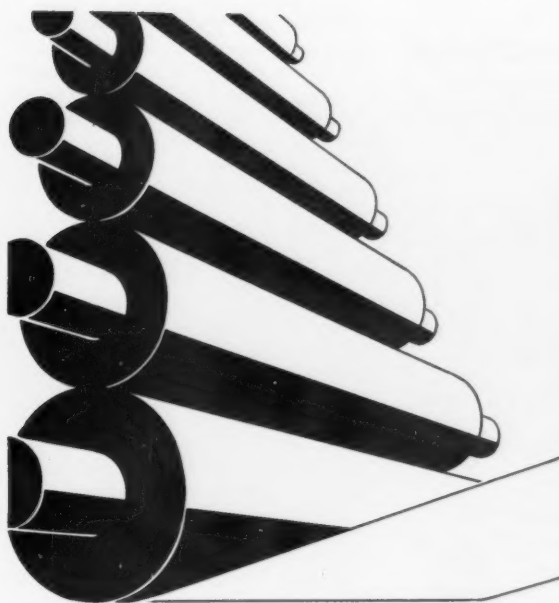
Write for Illustrated Folder

J. H. DUPASQUIER 560 E. Clarendon St.
Gladstone, Oregon

RAY SMYTHE CO.

Pulp, Paper and Wood Mill Machinery and Supplies

729 S. W. ALDER STREET, PORTLAND 5, ORE. CA 3-0502



**How do you measure
calender roll performance?**



**"... continuous production
without breakdown"**

Your maintenance engineer can rate your calender rolls. He sees the valuable production time lost when a calender goes down. He knows the cost of labor when rolls are changed.

Butterworth Dura-Smooth Rolls give the production you need for profit, the finish you need for sales. Try one Butterworth Refill on your calender stack. Record its long service life. See how many extra hours of service it gives before needing turning down or refilling.

Made of top quality, high rag content paper, Butterworth Calender Rolls meet your specifications. They're pretested for hardness, smoothness and density before delivery.

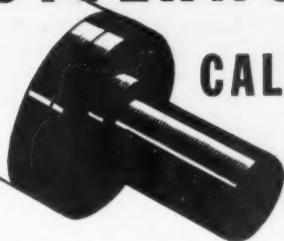
Write for quotation on new or refilled Butterworth Calender Rolls. They are furnished for all makes of calenders.



H. W. BUTTERWORTH & SONS CO.
Bethayres, Pa.
Division of Van Norman Industries, Inc.

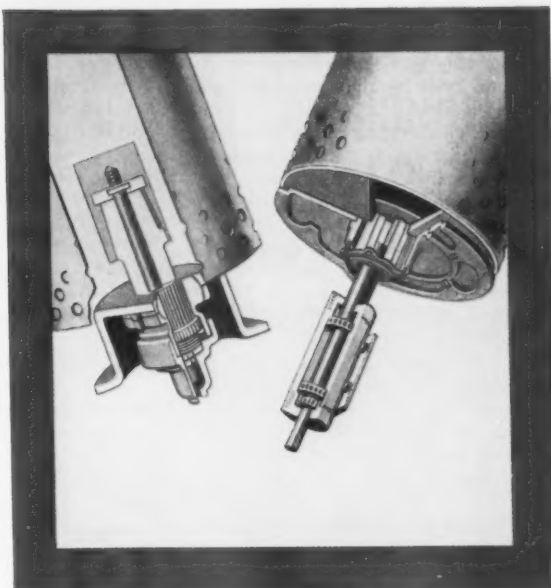
BUTTERWORTH

**CALENDER
ROLLS**



BELOIT UNIT MODERNIZATION

ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS



Beloit rectifier rolls

- Sheet edges hard to control?
- Rectifier rolls producing lumps and strings?
 - Flow "skating" on wire?
- Fiber flocs disturbing formation?

Beloit Rectifier Rolls for positive flow control

Beloit low-cost rectifier rolls, when properly located in your inlet, can eliminate the above problems. Here are some of the engineering features: external antifriction bearings or simple spherical bearings • quick removable journals • wide range of hole sizes, patterns, and open areas available • polished stainless steel construction or rubber-covered construction • scalloped flow stabilizing fins • holes chamfered both internally and externally.

» **ACT** Write for facts—or let a Beloit Sales Engineer show you the economy and operating advantages of Beloit rectifier rolls. Write to Beloit Iron Works, Beloit, Wisconsin.



BELOIT

PAPER MACHINERY

your partner in papermaking

PULP & PAPER

Equipment & Supplies

allows operator to over-ride his hand-set operating speed, gives faster shuttling and frees his right hand to control the loader.

Specifications: Tractor engine develops 42.5 drawbar hp in gasoline models. Option of a diesel engine is available. Tractor's shipping weight is 3,800 lb., or 5,000 lb. with optional cast iron rear wheels. New loader, developed for use with this tractor, has 2,500 lb. capacity, 5,500 lb. break-away limit, lift height of close to 11 ft. and regular material bucket sizes of $\frac{1}{2}$ yd. and $\frac{3}{4}$ cu. yd. Bucket sizes up to a full cubic yard and other loader attachments are available. Two models are offered, the 1821 which is standard-equipped and the 1841 which in addition has power take-off and an internal hydraulic system with three point linkage for rear attached equipment.

Supplier: Tractor and Implement Div., Ford Motor Co., Birmingham, Mich., Midwest 4-5800.

Pellet Mill Dies

... Perform Better, Cost Less

Applications: For making pellets.

Advantages: New series of high alloy pellet mill dies are mass produced on automatic drilling equipment. In spite of higher cost of superior die materials used, expensive price reductions have been made possible by lowered production costs. Features of these dies are: lowest cost per ton for production of quality pellets; harder and longer wearing; higher corrosion resistance; smoother, more perfectly drilled holes; superior service life at unit prices.

Specifications: Available in popular die sizes.

Supplier: Sprout, Waldron & Co., Inc., Muncy, Pa., phone 6-3111.

Eight-inch Saran Lined Pipe

... Now Being Produced

Applications: For handling large volumes of corrosive liquids and gases.

Advantages: Saran, a vinylidene chloride copolymer resin, is resistant to practically all inorganic chemicals and to most organic solvents and compounds. It has good mechanical properties, is dimensionally stable and has relatively high heat distortion temperature.

Specifications: Pipe is supplied with threaded ends in maximum lengths of 10 ft. Saran liner is anchored under pressure in the steel tubing. Pipe can be used in applications from well below zero up to 200 F.

Supplier: Saran Lined Pipe Co., Ferndale, Mich.

CHEMICAL NEWS

Gum Rosin Sizes

Three new modified gum rosin sizes are now available from American Cyanamid Co., 30 Rockefeller Plaza, New York 20. Paper mill field tests have indicated that the sizes have "excellent sizing efficiency and effect high brightness." Accobrite 4028 (unfortified) and Cyfor 4029 (fortified) are shipped as 80% solids, and Cyfor 4016A (fortified) is shipped as 70% solids. All are said to have low foam characteristics.

Monsanto Builds at Nitro

A plant for the production of Mersize has been constructed at Nitro, W. Va., by Monsanto Chemical Co. The chemically fortified pale rosin size gives water resistance to paper and paperboard.

Monsanto has under construction a similar unit in Seattle to serve the paper industry in the Northwest. Mersize is currently being produced at Baxley, Ga., and at Montreal, Que. Completion of the Nitro unit was set for January.

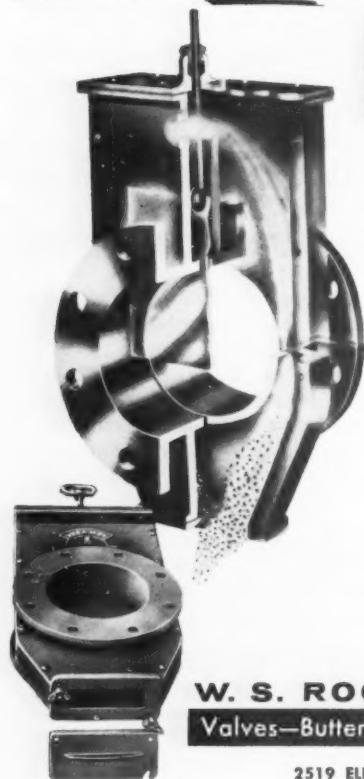
Cold Water Swelling Starch

Kobond, said to be the first cold water swelling carrier starch designed specifically for corrugating, is available in commercial quantities. According to National Starch Products Inc., 750 Third Ave., New York 16, the new material eliminates cooking, increases adhesive mileage, improves board quality and is compatible with any raw starch used in corrugating. Kobond has been field tested for approximately nine months.

Oil and Grease Remover

Betz Boil-Out is used for the removal of oil and grease from new boilers prior to placing them in service and can also be employed in removing oil from boilers contaminated due to operating conditions. It is prepared from organic and inorganic emulsifying and dispersive agents. (Boil-Out is not recommended for the removal of boiler or mill scale.) Manufactured by Betz Laboratories Inc., Gillingham & Worth Sts., Philadelphia 24, the removal agent is available in the form of 1-lb. briquettes and is supplied in 50-lb. units.

You need never remove



KWIKLEEN

SLIDE VALVES from the lines for cleaning

For fluids, air or gases containing solids or for free flowing granular materials that clog or jam conventional valves—Kwikleen is the answer.

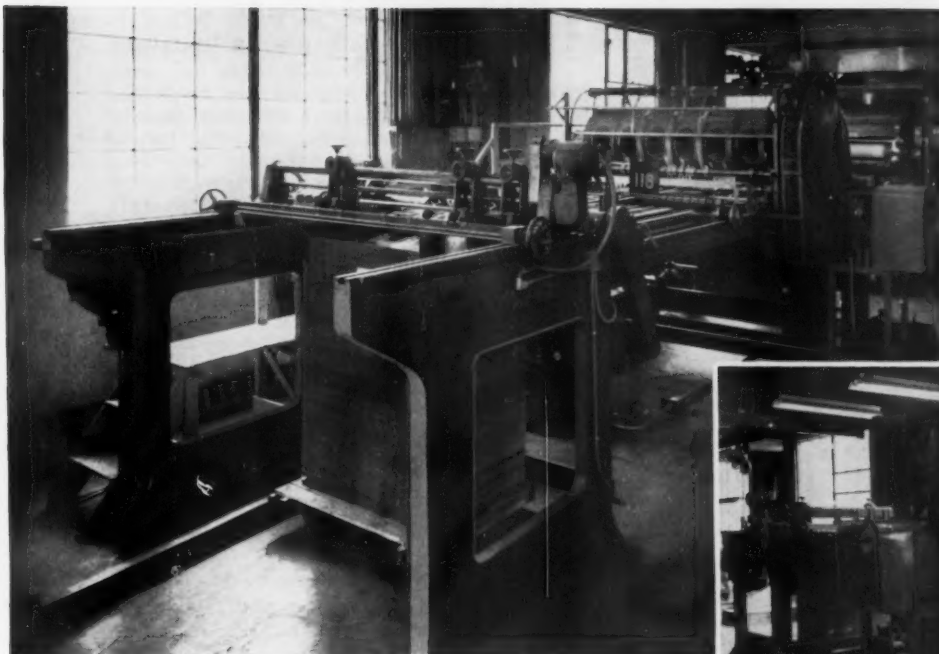
It permits 100 per cent flow in full open position and quick shut-off manually or mechanically. Easily, quickly cleaned by removing bottom plates. The valve need not be removed from the line. Sediment drops out or can be blown or flushed out by air or water.

Ask for Bulletin 501.

W. S. ROCKWELL COMPANY
Valves—Butterfly • Slide • Diaphragm • Special

2519 ELIOT STREET • FAIRFIELD, CONN.

Clark-Aiken SHEETER VERSATILITY

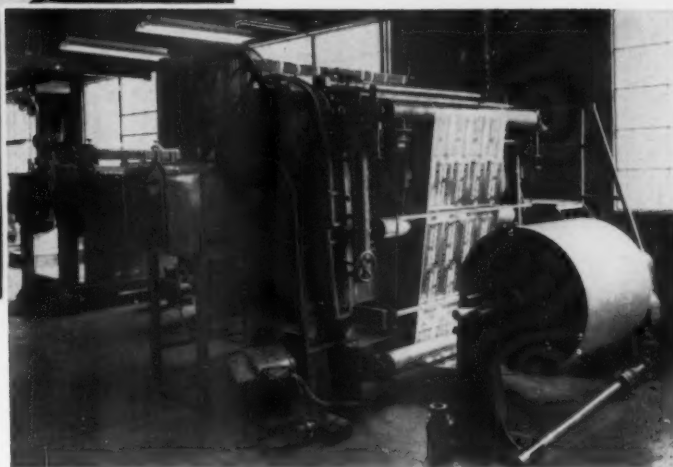


BOOSTS FINISHING ROOM PROFITS

at Pacific Coast Foil Company's San Francisco Plant . . .

Summarizing Pacific Coast Foil Company's experience in sheeting foil on Clark-Aiken equipment, Mr. R. Shelley Wood, Jr., assistant to the president, writes:

"Our Clark-Aiken sheeter displays the versatility necessary to make it a profitable adjunct to our aluminum foil converting operation. We sheet laminated materials of a wide weight range with equal facility. Even single roll feeding of the lightest weight materials presents no problem. In addition, the sheeter handles with equal ease, any sheet size normally needed in a converting operation. It adjusts to rapid short run changeovers to different sheet sizes with a minimum of set-up time. One of its most valuable features, in our operation, is the overlapping delivery and jogging which almost eliminates hand work in succeeding operations. This, of course, leads to great savings in production time and shortens our delivery schedules. Other salient points are the ease with which it adapts to electric eye control and the absence of all but the most nominal maintenance costs."



Clark-Aiken Equipment is custom tailored to your finishing room requirements . . .

Pacific Coast Foil Company's experience is typical of the results achieved through practical finishing room automation engineered by Clark-Aiken to fit specific requirements.

If your converting operation is bogged down because of slow or inefficient foil sheeting place your problem in the hands of Clark-Aiken engineers with complete confidence. Let them analyze your needs and make recommendations based on their findings. You will realize the benefits that only modern production techniques and up-to-date machinery can assure you.

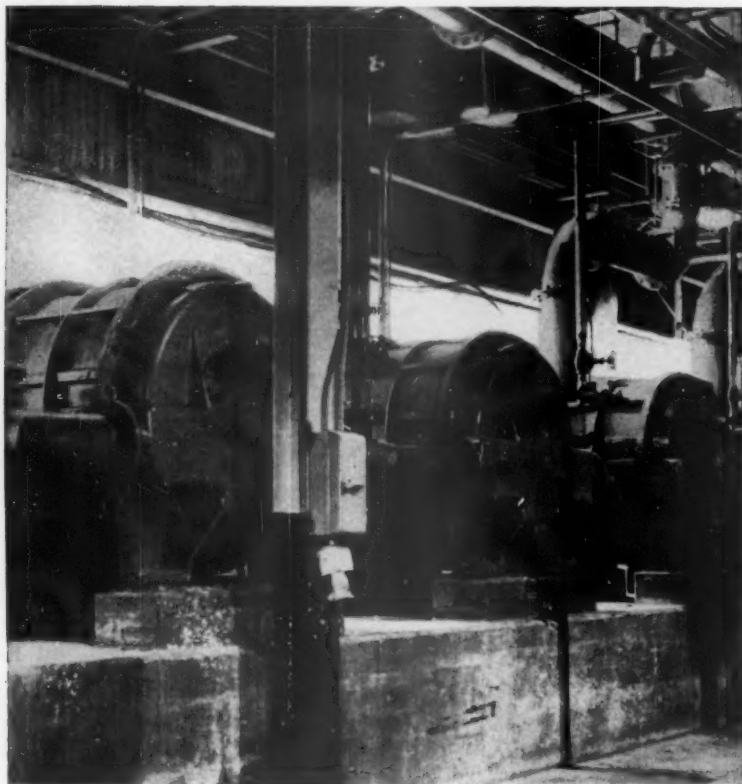
You profit three ways—increased production, lower operating costs and minimum maintenance costs. Consult Clark-Aiken for prompt and qualified consideration of your finishing room production problems.

THE
Clark-Aiken
COMPANY

957 SPRINGFIELD ROAD

LEE, MASSACHUSETTS

What, actually, do Vacuum Pumps on paper machines handle?



Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

NASH ENGINEERING COMPANY

443 WILSON ROAD, SO. NORWALK, CONN.

LITERATURE

Infilco Mixer Bulletin

"Mixers and Mixing" is a bulletin recently published by Infilco Inc., manufacturer of water and waste treating and industrial process equipment. Included are a discussion of the theory of mixing and comparisons between the various types of mixing equipment. Bulletin 730 may be obtained from Infilco Inc., P. O. Box 5033, Tucson, Ariz.

Control Systems for Boilers

Available from Iron Firemen is a detailed folder (No. 5803-A) on pre-wired, pre-tested panel control systems for automatic oil, gas or dual-fuel burners in commercial and industrial boiler installations. Included are dimensions, illustrations, special advantages and a selection chart for panel assembly specifications. Contact Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, O.

Tray Type Deaerating Heaters

A revised and enlarged bulletin (WC-106A) describing tray type deaerating heaters is available from Graver Water Conditioning Co. The publication covers subjects such as the principles of deaeration; tray heater operation; standard heater design and applications; accessory equipment, and the design and fabrication of tray utility heaters. Contact Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.

Pancake Motor

A drip-proof pancake motor that is said to reduce motor length by as much as 54% over standard units is described in a bulletin (No. 2150) recently published by Louis Allis. Offered in ratings of from 1 to 15 hp., the motor is of the flange type and is of conventional radial air-gap design. It can be furnished with an integrally-mounted brake. Write Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.

Cold Caustic Pulping

Bulletin P-44 is a detailed technical report on the cold caustic pulping of mixed hardwoods. Available through Sprout, Waldron & Co., the report was prepared by B. H. Bamer, mill mgr., and H. Miller, pulp mill supt., at Stone Container Corp., Coshocton, O. Includes detailed process description, flow sheet and complete equipment data. Pulping operation and production quality control testing described. Results of studies of pulping and papermaking variables are discussed. Write publicity dept., Sprout, Waldron & Co. Inc., 130 Logan St., Muncy, Pa.

For High Speed Paper Machines with Revolving Syphon Pipes

In the Type LN Johnson Joints the revolving syphon pipe is made a part of the rotating assembly, yet is permitted longitudinal movement. Sealing is still accomplished without packing. Simple support rods carry all the weight of joint and connections, permit the rotating assembly to "float" freely inside. Special hangers and brackets adapt the mounting for machines with either open or enclosed gearing.

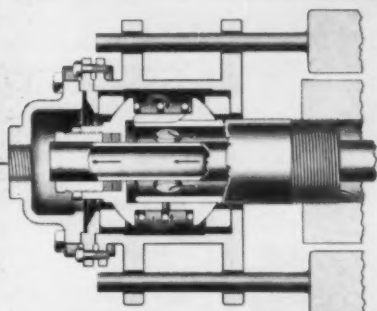
Johnson Joints fit all needs on paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses. For full data on Type LN write for Bulletin N-2002.

Type LN
Johnson
ROTARY
PRESSURE
Joints

"First in
the paper
industry"



THE JOHNSON CORPORATION
849 Wood St., Three Rivers, Michigan



HANCHETT CIRCULAR KNIFE GRINDER

For TOP and BOTTOM SLITTER KNIVES
SCORING KNIVES and SEGMENTS
SEMI and FULL Automatic



GUARANTEE:

1. Concentric with Bore and Running Truth .0005
2. Micro Inch Finishes
3. Grinds Single, Double and Compound Bevels
4. Positive — Accurate Fixturing
5. Longer Mill Life (Less Changes)

**MODEL
SK-24
WET
GRIND**

TEST GRIND

We are prepared to grind knives for your inspection and Mill Test.

HANCHETT MANUFACTURING CO.

Main Office
BIG RAPIDS, MICHIGAN

West Coast
PORTLAND 1, OREGON

BELOIT UNIT MODERNIZATION

ONE OF A SERIES SHOWING TYPICAL BELOIT SOLUTIONS TO COMMON MILL PROBLEMS



Beloit streamflow valve

- Does your present fan pump valve create flow pulsations?...dirt and slime lumps? ...eddies and cross-currents?

Beloit Streamflow Valves ... 6 sizes ... elbow or tee

Beloit streamflow valves are designed specifically for controlling paper machine water rates. Throttling is accomplished with a central pear-shaped plug, the required flow passing smoothly around the plug. Result: uniform discharge to headbox without pulsations, eddies, or lumps! Engineering features include: positive mechanical positioning—no "floating" or "hunting" • wide gallonage range with minimum head loss • self-cleaning design • air-motor operator • valve position indicator for quick setting • heavy-duty stainless steel construction • simple controls.

» ACT! Streamline your flow problems. For complete information about Beloit streamflow valves write to Beloit Iron Works, Beloit, Wisconsin.



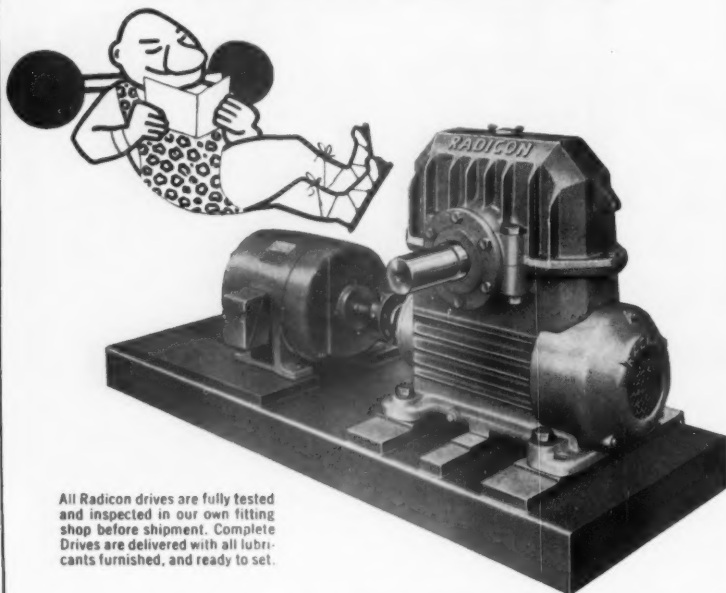
BELOIT

PAPER MACHINERY

your partner in papermaking

Almost Nothing To Do...
when you select—

RADICON COMPLETE DRIVES



All Radicon drives are fully tested and inspected in our own fitting shop before shipment. Complete Drives are delivered with all lubricants furnished, and ready to set.

Eliminate a major part of your drive design problems—just position the efficient new Radicon Complete Drive, set six bolts, and you're ready to roll!

No need to buy reducers, motors, couplings—then spend time shim-ming and aligning. Radicon reducers and motors are already carefully shimmed and aligned on heavy fabricated steel base plates, of double box construction, firmly ribbed for rigidity. This means minimum stress at the flexible coupling...long service, low maintenance.

Fan-cooled Radicon Speed Reducers, like the type RHU shown with the above complete drive, are being specified by original equipment manufacturers in many industries these days. They have learned Radicon's ability to withstand extremes of temperature, dust, dirt and rain—all with low initial cost, and low maintenance! Find out for yourself—write or phone today.

Immediate delivery 3" to 14", all standard ratios from 5:1 to 60:1. Radicon complete drives supplied by all authorized David Brown factory branches and distributors.



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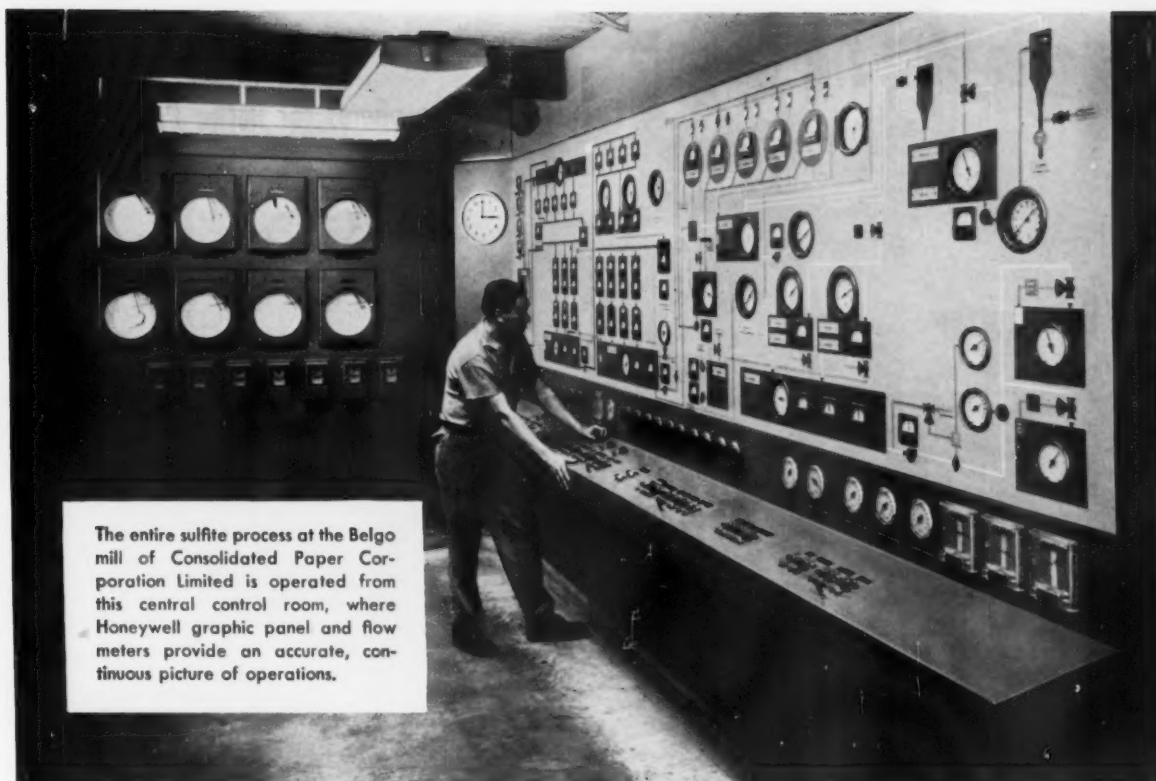
MEETING DATES CALENDAR

- Feb. 12
Michigan Div., APPMSA
Hotel Harris, Kalamazoo, Mich.
- Feb. 22-26
Paper Week—APPA, TAPPI, SAPI
Waldorf-Astoria and Hotel Commodore, New York
- Mar. 16-20
National Assn. of Corrosion Engineers, Pulp & Paper Symposium
Hotel Sherman, Chicago, Ill.
- Mar. 19
Michigan Div., APPMSA
Inman's Restaurant, Galesburg, Mich.
- Mar. 23-26
Folding Paper Box Assn. of America
Drake Hotel, Chicago, Ill.
- Mar. 24
Golden Gate Dist., TAPPI
El Rio Motel, Antioch, Cal.
- Apr. 11
Michigan Div., APPMSA
Hotel Harris, Kalamazoo, Mich.
- Apr. 11-13
Southern Pine Assn., Machinery Exposition
Municipal Auditorium, New Orleans, La.
- Apr. 30-May 3
Penn-Jer-Del Div., APPMSA
Robert Treat Hotel, Newark, N. J.
- May 5
Golden Gate Dist., TAPPI
Claremont Hotel, Berkeley, Cal.
- May 14
Michigan Div., APPMSA
Hotel Harris, Kalamazoo, Mich.
- May 21-23
Pacific Coast Div., APPMSA, and Pacific Coast Section, TAPPI, Multiple Water Use Seminar
Gearhart Hotel, Gearhart, Ore.
- May 25-27
TAPPI Coating Conference
Hotel Statler, Boston, Mass.
- June 2-4
APPMSA National Meeting
Shamrock-Hilton Hotel, Houston, Texas

Airfloat Table Conveyor

Lamb-Grays Harbor Co., producer of pulp-paper finishing, transport and handling equipment at Hoquiam, Wash., recently published bulletins which are now available. One is on the firm's Airfloat Table Conveyor, a patented conveying system for paper handling which "floats the load on a film of air." Packages are said to be easily handled and stacks of paper can be pushed along even by inexperienced personnel without danger of slippage or disarrangement of product alignment.

The brochure on roll finishing systems contains a large fold-out diagram illustrating time, labor and capital cost-saving components in finishing lines.



The entire sulfite process at the Belgo mill of Consolidated Paper Corporation Limited is operated from this central control room, where Honeywell graphic panel and flow meters provide an accurate, continuous picture of operations.

Consolidated Paper Corp., Ltd., increases yield with new, Honeywell-controlled sulfite process

The new high-yield sulfite process is bringing a 20% production increase, a 30% chemical saving, and a great reduction in steam use to Consolidated's Belgo Division, Shawinigan, Quebec, Canada. This commercial application of the process features a complete Honeywell control system.

The new process consists essentially of a shortened sulfite cook after which the fibres are "rubbed" to a pulp by mechanical refiners. Much of the lignin and hemicelluloses that would normally be removed at the

end of a standard cook are retained. The process operates on three floors of the Consolidated mill, yet, with the highly centralized Honeywell instrumentation, requires only one operator and an assistant.

Your nearby Honeywell field engineer will be glad to discuss your mill's instrumentation needs in installing the new high-yield sulfite process. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell



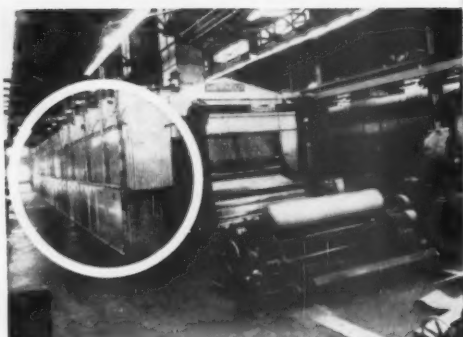
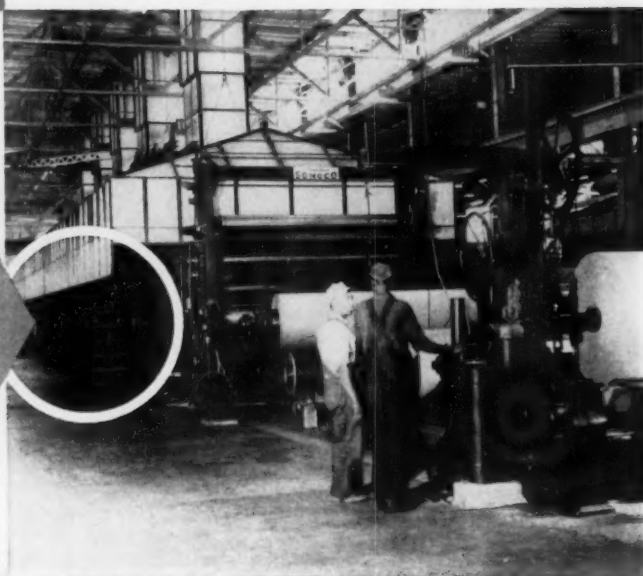
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A Cost-Cutting Suggestion...

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A competent Ross Engineer with full knowledge of hoods and their functioning, will be glad to call, discuss your problem and then give you a firm quote on transforming your present hood into the well-known Ross-Hooper Hood.

You may not be in position to completely modernize ...or to completely step up your production to get lower per-ton costs...but if you are operating with an open hood over the machine dryer section, look into the cost-savings and greater production possible through completely enclosing that section.

One of the paper mills in the South took this step in connection with its corrugating medium machine and came up with some substantial savings in costs, enough to pay for the job in about a year. Here are the measurable gains:

- ★ production increased (10%)
- ★ steam requirements reduced (7%)
- ★ exhaust air and fan power reduced (40%)
- ★ more uniform moisture control across sheet
- ★ more comfortable working conditions

NOTE: the change-over was accomplished during a two week summer shut-down

Again may we suggest: if you have an open hood over the dryer section, ask to have a Ross Engineer study your machine layout and report as to the probable savings that will come when you install the Ross-Hooper Hood.



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Carroll Ross Engineering Company, Ltd., England

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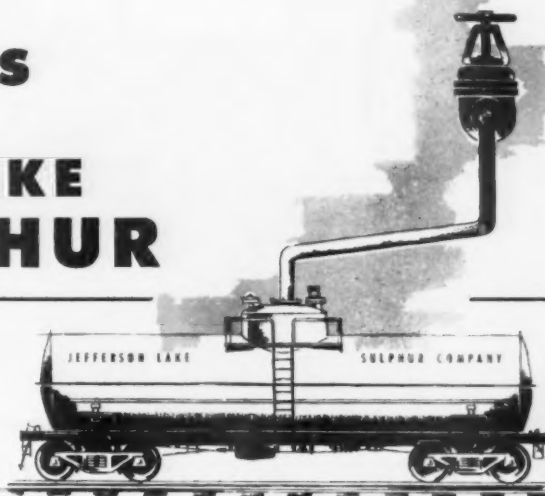
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And he finds much of what he wants and needs in the advertisements in his businesspaper. So, logically, he reads the advertising with the same scrutinizing care he devotes to the editorial pages.

Take a tip from the man on the move who wants to keep his job and his business *moving*—on the "inside track." Subscribe to your businesspaper. Read every issue. Carefully. Thoroughly. Searchingly.

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PAPER**

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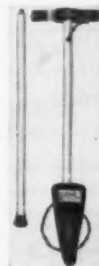
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Watertown, N. Y.

Associated with
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Pacific Coast Representative
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If awards were given for making good paper, it would be found that the winners were regular users of Cambridge Surface Pyrometers.

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Write for bulletin 194-5A
CAMBRIDGE INSTRUMENT CO., Inc.
3562 Grand Central Terminal
New York 17, N. Y.

CAMBRIDGE SURFACE PYROMETERS



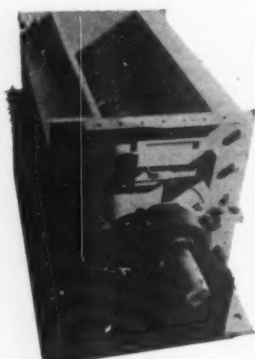
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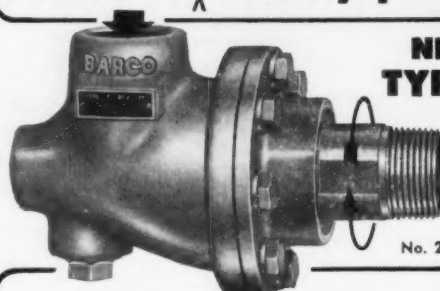
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We are in the process of dismantling the Oregon-American lumber plant at Veronia, Oregon and have for sale monorail system, trimmers, motors, conveyer, chains, pipe, dry kiln cars, blowers and miscellaneous equipment too numerous to mention. Your inquiry is invited. C. S. Heinz, Jr. Construction Co., Inc., P. O. Box 277, Veronia, Oregon, Phone: HAZel 9-6741.

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The Last Word **PULP & PAPER** Editors' Page

How Would They Like a Nibble of Wet Strength Paper?

Mr. Albert W. Wilson, Editor
PULP & PAPER, Chicago, Ill.

Dear Al:

In rummaging through old files, I came upon a bit of verse which may interest you. The verse carries no by-line.



I know nothing of its origin. However, my source for it is an advertising folder of Japan Paper Co. It does go back quite a few years. A copy of the poem is attached.

Since the theme of the poem is the Bookworm's Lament, I also am submitting a photocopy of a page from the book, "The Enemies of Books" by W. Blades. The page carries three illustrations. The book dates back to 1902 and this illustration, of course, as indicated in the caption, was taken from "Micrographia" by R. Hooke (London, 1665).

Not being an entomologist, I cannot vouch for

any authenticity.

HARRY E. WESTON
Secretary and Treasurer

American Pulp and Paper Mill Supts. Assn., Chicago, Ill.

The Bookworm's Lament

"Thro' Papyrus with wisdom stored
In ancient days my way I bored;
Ah, memory of that far off time,
And succulence of Nilus' slime!
'Twas nature's paper bred my kind
And nursed fat worms of rev'rent mind!
The giants we before the flood,
With reptiles bred in Egypt's mud!—
Lost kindred mine that went to ash
With Alexandria's lore and trash.
You'd scarce believe the diet strange
Thro' which the Bookworm now must range.
Cotton paper was plaguy stuff,
And linen rag was bad enough;
But things have come to such a pass
That paper's made of straw and grass!
Esparto, ramie, young bamboo,
All these and more I've eaten thro'!"

But soft; for now I must relate
Th' apotheosis of my fate:
Dyspeptic 'mid these modern books,
I sought old haunts and shady nooks,
Intent on ancient tomes forgot

That oft had been knocked down by lot;
But mov'd—by what I cannot tell—
Unless its most unusual smell—
I tried a book of goodly size,
The hardest it of all my tries!
Away I bored, but I was floored,
Ye Gods! the thing was made of board.
Yes, wood must now their paper give—
Stuff that ye may not eat, and live!

Author Unknown

What Next?

There seems to be no limit to the uses of wood.

For harrassed pulp and paper company executives—even editors, too—this may be good news. A new by-product of wood may be a potential ulcer remedy.

We have it on no less an authority than Dr. T. Lloyd Fletcher, of the University of Washington school of medicine. He found that in rats, calcium lignin sulfonates reduce gastric acidity and counteract experimental peptic ulcer.

A woodpulp by-product, vanillin, is also being utilized in a new test for diabetes.

How are you feeling today? Just go over and dip into that beater and you'll feel better, maybe.

Deserves Equal Headlines

Along with the occasional reports of fish "kills"—and seldom is the real cause known—it would seem that a story of how a major pulp manufacturer is increasing the fish population would deserve equal headlines.

Weyerhaeuser Timber Co., in cooperation with the Oregon Fish Commission, has announced construction of an experimental natural fish farm for salmon on company tree farm lands along the east fork of Coos County's Millicoma River. The experiment, costing \$8,000, is designed to lower current costs of raising fish in hatcheries by placing fingerlings in impounded waters with a natural food supply. The 10-acre pond will hold 500,000 salmon fingerlings.

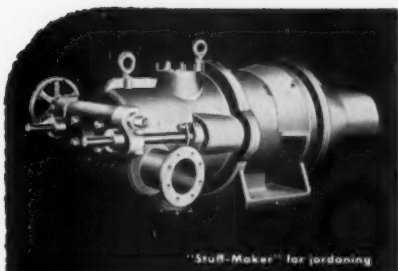
We suggest a picture and a page one headline for the cities and towns where so many thousands of people earn their livelihood producing chemical pulp—and where many other thousands benefit indirectly from their incomes.

A Good Cause

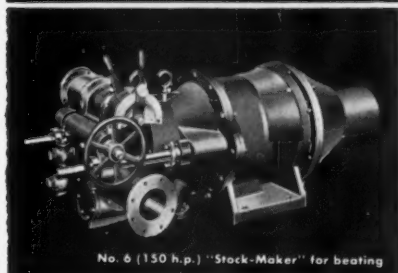
The fund campaign of the American Chemical Society for its new national headquarters building in Washington, D.C. has a goal of \$3 million. The pulp and paper industry's share is \$25,000. To date, this industry has contributed \$7,300; almost half came from one company.

One spokesman for the paper industry, whose company has contributed its share, remarked to this publication, "It seems strange that such a great industry cannot come through with its share. It seems strange, especially when you look at some of the tremendous buildings that labor can put up in the nation's capital."

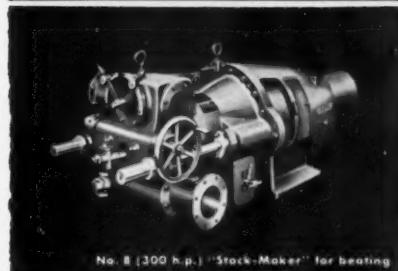
The industry turned out 1800 strong recently to honor one of its members at a \$100-a-plate dinner. This was a fine gesture. Contributions to the new ACS national headquarters building is another fine cause; and may be sent to John B. Calkin, president, Calkin & Bayley, 50 East 41st St., New York 17, N.Y.



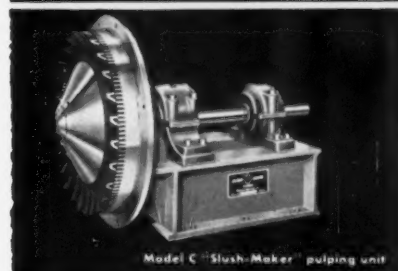
"Stuff-Maker" for jordaning



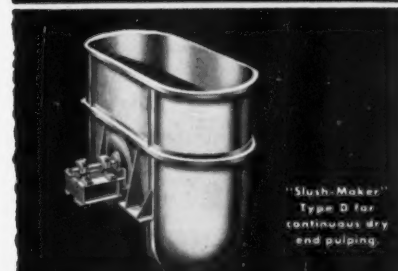
No. 6 (150 h.p.) "Stock-Maker" for beating



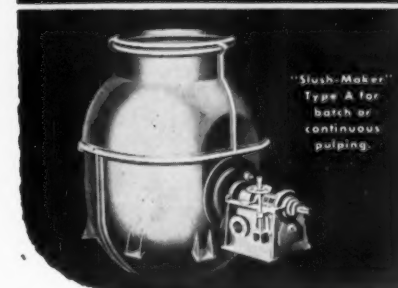
No. 8 (300 h.p.) "Stock-Maker" for beating



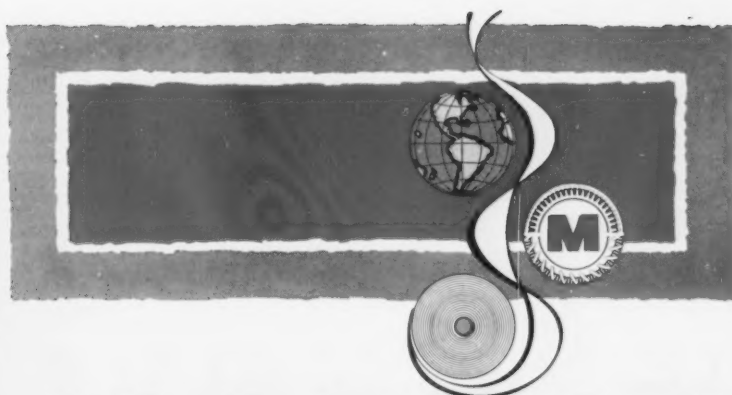
Model C "Slush-Maker" pulping unit



"Slush-Maker"
Type D for
continuous dry
end pulping.



"Slush-Maker"
Type A for
batch or
continuous
pulping.



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